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FROM

THE QUARTERLY JOURNAL
OF ECONOMICS

MUNICIPAL PUBLIC WORKS

The

MUNICIPAL PUBLIC WORKS

THEIR INCEPTION, CONSTRUCTION AND MANAGEMENT

BY

S. WHINERY

CIVIL ENGINEER

New York

THE MACMILLAN COMPANY

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1903

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PREFACE

THIS book is intended for the inexperienced city official and for the urban citizen. Numbers of good and earnest men are elected or appointed to official positions in our municipal governments whose interests and previous business experience and training have not been of such a character as to lead them to study the principles controlling, and the problems that will be met with in conducting, municipal public works, and who, upon assuming the duties and responsibilities of office, feel that they are deficient in the special knowledge necessary to enable them to discharge intelligently and efficiently the duties of their new positions. The veteran in municipal service and the student of municipal administration will not find in the book much that is new to them, although they may find that some matters are presented from points of view different from those to which they have been accustomed.

Believing as I do that it is both the privilege and the duty of every citizen to take an active interest and part in municipal government, and particularly in the carrying out of municipal public works, I have thought that a book of this character might help to arouse such an interest in those who have not previously given much attention to the subject, as well as to stimulate further interest and inquiry among those already familiar with it.

Such being the purpose of the book, I have avoided technical treatment of the subjects, and have introduced statistics and details only where they seemed necessary to illustrate or enforce the general statements. The idea has been to deal with *principles* rather than with the details of practice.

If in some matters I have departed from well-worn paths and traditional views, it has been with the conviction that such departures are not only justified by facts and experience, but are essential to a correct conception of municipal business. Whether these views be approved or not by those whose study and experience entitle their opinions to weight, it is hoped that they may have some value in stimulating the discussion of the subjects to which they refer.

Recognizing that the class of persons whose interest it is desired to enlist is composed largely of business men whose time is already closely occupied, I have endeavored to be brief, even at the risk of laying myself open to the charge of inadequate treatment on many points.

A casual examination will suffice to show that I have not attempted to cover in a scholarly or exhaustive manner any of the subjects taken up. The book has been written in the intervals of other employment, as leisure permitted, and with little attempt to read up or consult authorities.

I at first intended to devote a final chapter to a brief bibliography of the subject of municipal government and cognate subjects. But the literature of the subject is so extensive that it was found very difficult to restrict within reasonable limits any list of books and papers without

great danger of omitting much of equal or greater value, since it is quite impossible for one man to say what books will be of most interest and value to another. Besides, there already exists a very full and admirable bibliography of the subject, from which students and general readers can readily select the literature that is likely to supply what they may think best suited to their purpose.[1]

S. W.

New York,
May 1, 1903.

[1] "A Bibliography of Municipal Problems and City Conditions." New York Reform Club Committee on City Affairs, 52 William Street, New York. pp. 346. $1.50.

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MUNICIPAL PUBLIC WORKS

MUNICIPAL PUBLIC WORKS

CHAPTER I

IMPORTANCE OF MUNICIPAL PUBLIC WORKS

THE twelfth census (1900) of the United States discloses the startling fact that 37.3 per cent of the whole population of the country lives in cities and towns of 4000 inhabitants and upward. Nearly one-third of the population (33.1 per cent) lives in cities and towns of 8000 or more inhabitants. The censuses for past decennial periods show that the ratio of urban to rural population is rapidly increasing. Thus the percentages of the population comprised in cities and towns having a population of 8000 or more, for a number of decades, as reported by the Census Bureau, are as follows: —

1840	8.5 per cent
1850	12.5 " "
1860	16.1 " "
1870	20.9 " "
1880	22.6 " "
1890	29.2 " "
1900	33.1 " "

It is not within the province of this book to discuss the causes of this tendency of our population to seek urban life, or the consequences that are likely to result therefrom in the future.

There must, of course, be some adequate cause or causes for the growth of the cities at the expense of the country. Among these it will be conceded that not the least is the greater public provision made for the comfort and convenience of the urban as compared with the rural population. The aggregation of people into compact masses has made possible and favored such provision. Conveniences that it would be well-nigh impossible to supply at any cost to a scattered rural population, become attainable at moderate cost when a large number of people live in close proximity to each other.

Among these conveniences, which become necessities to the urban population, may be mentioned the supply of water for domestic purposes, sewers for carrying away and disposing of waste matter, protection from fire, lighting systems for supplying light to dwellings and streets, improved roadways, schools, libraries, and public parks. These and others of like character constitute what are collectively called the public works of a city, and the business of constructing, operating, and maintaining them has become one of the principal functions of municipal government, while upon them is expended the greater part of the municipal revenues derived from taxation.

The construction, operation, and maintenance of these municipal public works have developed into a distinct department of human activity in our cities and towns, and have called into action the best efforts of trained engineers and specialists, requiring, as they do, a high degree of technical knowledge, skill, and experience, as well as of business capacity.

Considered in their financial aspect alone, the municipal

public works of our towns and cities assume such a degree of importance as to merit careful consideration. Unfortunately, the statistics of the business have never been properly collected and published, and we have no exact data relating to the money now invested in improvements of this character, or of the cost of operating and maintaining public works in the past. Very recently the Department of Labor at Washington, acting under a law passed by Congress in 1888, has made a very creditable effort to collect and publish statistics of the public works of all cities in the United States having a population of 30,000 and more. The latest results of this investigation are published in Bulletin No. 36 of that Department, issued in September, 1901. No statistics of the total amount of money invested in municipal public works are given, but only the expenditure for the preceding fiscal year. These will, however, serve to give an idea of the magnitude of the work and the enormous sums of money devoted to it. Some of the items are, in round numbers, as follows: —

FOR CONSTRUCTION AND CAPITAL ACCOUNT

Expended on streets	$26,654,600
" " sewers	9,429,300
" " water supply	14,767,100
" " docks, ferries, bridges, markets	5,009,200
" " electric lights and gas-works	344,100
" " parks and gardens, bath-houses, etc.	5,221,400
" " schools	14,849,700
" " libraries, art museums	1,936,000
" " fire departments	2,074,800
" " police, police courts, jails, work-houses, and reformatories	812,200
" " health and hospitals	950,500
	$82,048,900

FOR OPERATION AND MAINTENANCE

Expended on	street cleaning and sprinkling	$10,871,300
"	" streets and pavements	11,248,200
"	" sewers	3,268,300
"	" water supply	15,436,000
"	" docks, ferries, bridges, markets	3,165,600
"	" electric light and gas works, and lighting	14,612,600
"	" parks and gardens	6,021,200
"	" schools	64,458,500
"	" libraries, art galleries, museums, etc.	2,814,800
"	" fire departments	22,949,300
"	" police courts, jails, workhouses, and reformatories	4,672,500
"	" health, hospitals, almshouses, etc.	15,902,600
"	" garbage removal and treatment	5,113,000
		$180,533,900

It appears from this statement that the total amount of money expended upon public works in that one year in these cities was $262,582,800.[1]

The population of the 135 cities embraced in the inquiry was, according to the twelfth census (1900), about 19,000,000. It appears, therefore, that these cities expended in that year for the public works named above, an average of $4.32 per capita for construction and capital account,

[1] These figures are not official. In the report only the items for each city are given, and I have computed the totals. It should be stated, also, that some of the figures given in the report are not claimed to be strictly correct. Owing to the different methods of keeping accounts in the various cities, the correct figures for each item were not always obtainable by the Department of Labor, and items were often found charged to one account that should have been charged to another, or the accounts were not subdivided as in the report. Attention is called to these facts by footnotes and explanations in the report. The figures given are, however, sufficiently accurate for our purpose.

and of $9.50 per capita for operation and maintenance, or a total of $13.82 per capita for both.

Large as these sums are, they do not by any means correctly represent the whole amount of money expended upon the public works of these cities, because in many instances such works belong to private corporations, and the accounts of these do not appear in the report of the Department of Labor. In the greater number of the cities the gas supply does not belong to the municipal corporation. In a large number the water supply is owned and operated by private companies, and this is also true of electric lighting plants in many cities. Not only are these semi-public works supported by the residents of the cities, but a liberal interest on their cost and usually a fair profit on their business is paid through charges for the service rendered.

As remarked above, we have no data from which to ascertain the total amount of money invested in public works in these cities. In one department, however, the report referred to gives statistics from which we may estimate approximately the whole amount expended for construction in that department. I refer to street paving.

The report of the Department of Labor for the preceding year (Bulletin No. 30 for the year ending September, 1900) gives the number of square yards of street pavements of the different kinds in 129 cities embraced in that report. We know approximately the average cost per square yard of the several varieties of pavements, and using these prices we may arrive at a fair idea of the amount invested in street pavements in these 129 cities, as follows: —

21,680,245 sq. yds.	cobble stone	at $ .80	$ 17,344,196.00
32,716,515 " "	granite block	" 3.50	114,507,802.50
21,738,210 " "	brick	" 2.25	48,910,972.50
27,733,572 " "	wooden block	" 1.25	34,667,965.00
34,471,804 " "	asphalt and asphalt block	" 2.75	94,797,461.00
83,841,445 " "	Macadam	" .75	62,881,083.75
58,604,397 " "	gravel	" .70	41,023,077.75
18,432,210 " "	all other kinds	" 1.00	18,432,210.00
	Total		$432,564,768.50

It is unnecessary to argue that the agencies and methods employed in dealing with these enormous sums are worthy of careful and respectful consideration from a purely financial point of view alone. When, in addition, we appreciate that more than one-third of the population of the whole nation is directly or indirectly affected physically, financially, and even intellectually, morally, and socially by the fidelity and skill with which so vast a trust is administered by municipal authorities, the whole subject assumes an importance that cannot well be exaggerated. The very grave responsibility, therefore, that devolves upon those charged with the administration of so vast and important a trust cannot be overestimated when soberly considered. It is, for instance, a well-understood fact that certain among the most dreaded diseases to which we are subject have their origin in, and are propagated and spread through the medium of impure water for domestic service, or through defective sewerage. Thus it may be considered as definitely settled that typhoid fever is caused by a specific germ, and that this germ is introduced into the human system through the medium of water used for drinking or culinary purposes. This being so, it must follow that if pure water only, free from

this specific germ, were supplied to and used by all inhabitants of our cities, this terrible disease would probably disappear entirely, or at any rate its ravages would be so greatly reduced that it would become one of the least important of the scourges that now afflict us. The report above referred to gives a list in detail of deaths from certain diseases in the 135 cities dealt with, from which it appears that the deaths from typhoid during the year amounted to a total of 6546, or more than 34 for each 100,000 of population. As, in this disease, at least five cases recover where one proves fatal, we may estimate that the total number of cases occurring in these cities during the year was in the neighborhood of 39,276.

Experience in cities where water of a high degree of purity is supplied indicates that it is quite practicable to reduce the deaths from typhoid to a number not exceeding five for each 100,000 of population. If this were accomplished in each of the 135 cities, it would result in a saving of over 5600 lives annually. The economic value of a human life has been variously estimated. It may be conservatively placed at not less than $5000. At this rate the value of the 5600 lives that might be saved annually from this disease reaches the enormous sum of $28,000,000. This figure does not take into consideration the loss of time and the incidental expenses that may be fairly charged against the disease, on account, not only of those who die, but of those who recover. In the report of the Engineer Commission on the extension and betterment of the water supply of Cincinnati, Ohio, dated March 20, 1896, this subject was considered, and I cannot do better than to quote from what was said therein: —

"The average annual loss from typhoid fever in the city of Cincinnati during the past six years was 164 lives, which, under the laws of this state, may be valued at $10,000 each. For each fatal case of typhoid there were not less than five cases which recovered; or the probable number of cases, exclusive of victims who perished in their battle with this disease, has been an average of 820 for the past six years, making a total of 984 cases. The average cost of medical attendance to all cases can be put at $40, and the average loss of time from work or school of those who recover is found to be about six weeks, which time can be valued at common laborer's wages, or $1.50 a day. The cost of burial of those who died can be taken on an average at $60 each, from which we deduce the following yearly cost of typhoid fever in this city alone: —

164 fatal cases	at	$10,000.00	$1,640,000.00
820 × 36 cases	"	1.50	44,280.00
984 doctor bills	"	40.00	39,360.00
164 burials	"	60.00	9,840.00
Total			$1,733,480.00

a sum which, if capitalized at four per cent for forty years, represents $84,310,162.92. This estimate, of course, does not take into account the number of cases and deaths among non-residents who may drink the water while in the city, and return to their homes before the symptoms of typhoid develop."

Even if we discount these figures very largely and apply the same line of reasoning to the 135 cities we are considering, the results will still be of such magnitude as to be appalling. The figures quoted

assume a total loss of $10,576 for each fatal case. Let us assume that the average loss would not exceed $5500 per fatal case. We shall then have, as the cost represented by 5600 fatal cases, $31,800,000 annually, which capitalized at four per cent per annum for thirty years (the reasonable life of a water works system) amounts to the enormous sum of nearly $550,000,000, and this sum might therefore be profitably expended by these cities in procuring a water supply sufficiently pure to reduce the typhoid fever death-rate to five in 100,000 of population. Typhoid fever is only one of the many diseases that are directly caused by, or whose propagation and malignity are largely increased by, preventable unsanitary conditions in our cities. It is true that in no other infectious disease is the specific cause so well known and the channel through which it enters the human body so definitely understood and so limited as in typhoid fever, but abundant observation has proved beyond doubt that a number of other diseases may be limited and controlled by strict attention to sanitation. The fact that smallpox, scarlet fever, diphtheria, and diarrhœa are most prevalent and most fatal in those parts of a city where least attention is given to cleanliness and sanitation is sufficient proof that there is a close connection between these diseases and filthy and unwholesome surroundings. Unclean streets are believed greatly to aggravate, if they do not directly cause, the epidemics of la grippe so common recently in our cities. The great mortality among children from diarrhœal diseases is known to be largely caused by impure water and unsanitary environments.

The total deaths from the diseases named (excluding typhoid) in the 135 cities, during the year covered by the report, is as follows: —

Deaths from smallpox	589
" " scarlet fever	2,180
" " diphtheria	9,712
" " dysentery, and diarrhœa and enteritis	26,655
Total	39,136

If the mortality from these diseases could be decreased but ten per cent (and no one doubts that this could be done) by proper sanitation, it would result in the saving of nearly 4000 lives annually in these cities.

It thus appears that the responsibility of municipalities in this one matter of the protection of human life from preventable disease is overwhelming. We tolerate this unnecessary human suffering and loss of life because we have grown to consider it a matter of course. If some great accident, due to the carelessness or neglect of the city officials, had occurred in Pittsburg in the year 1901, resulting in the sudden death of 100 people, the whole country would have been filled with horror and with just indignation at the criminal negligence of those whose want of care and proper precaution made such a disaster possible. And yet in that year 464 persons died in that city of typhoid fever, and it is as certain as anything human can be that at least 350 of these deaths would not have occurred had the city been supplied with pure water.

There are indications that the apathy that permits this needless destruction of human life to go on will not always be tolerated, and that the time will come when

municipal governments will be held responsible by the courts for such palpable offences against human life. Recent cases before the courts seem to indicate that they are disposed to award appropriate damages for lives sacrificed through failure of city authorities to exercise proper preventive care. Certain classes of accidental injuries, due to criminal neglect on the part of municipal corporations, have long been recognized as cases for substantial money damages, and when we consider the matter, it is difficult to see why deaths or injuries resulting from a preventable polluted water supply should not be placed in the same category as those due to careless neglect of dangerous holes or trenches in the streets, which are now recognized as actionable causes for damages. Should the courts adopt and act upon this view in the future, they would do more to call attention to the importance of pure water supplies than can be hoped for from any other source. It would at once be realized that no city could *afford* to poison its citizens with polluted water, if a supply of pure water could possibly be procured. Taxpayers and city officials would no longer look on with apathy while hundreds of human lives were being sacrificed through criminal neglect.

It is not alone in the matter of sanitation and regard for the health and the lives of the population that municipal public works are of great importance. The industrial and commercial prosperity of a city may be largely affected thereby. Pure and clean water is a necessity in not a few lines of manufacture, and the possession or absence of an abundance of it may attract or repel enterprises of this character. Well-paved streets directly affect

the people and the prosperity of a city in a financial way The difference in the cost of conducting business over poorly paved and well-paved streets is not easily reduced to the form of a definite account, but it may be shown to be so great, that the cost of providing and maintaining good pavements becomes, relatively, an unimportant item. Schools of a high degree of excellence, housed in commodious buildings and well supplied with the physical equipment for their successful operation, are a positive element in attracting the class of citizens that make a city commercially great, to say nothing of their vast influence upon the moral and social development of the community.

Again, the prices at which public service is supplied have a direct effect upon the commercial prosperity of a city. Cheap water, cheap light, and low taxes have a powerful influence not only in fostering existing industrial and commercial enterprises, but in attracting new ones to a city, and while natural conditions over which we have no control often determine the cost of such public service, careful and intelligent management of public works may often materially reduce that cost. In short, it may be asserted without fear of denial that all public works which promote the health and the physical welfare of the citizens of a city, or that tend to facilitate the transaction of business, have a potential influence upon its growth and commercial prosperity.

That there is a relation between the character of the public works of a city and the morals of its citizens is so well understood that it need not be argued, though the relation is not so tangible as are the commercial features

referred to above. The moral value to any community of superior schools is universally acknowledged. The benefits of public parks are not confined to their sanitary value alone, and it is now hardly necessary to argue that clean, well-paved, and well-lighted streets have a distinct moral influence upon those living along them.

The subject of this chapter is one that admits of and invites expansion to an almost unlimited extent, but reasonable brevity forbids pursuing it farther. What has been said should be sufficient to call attention to and illustrate the very great importance of the public works of a city from whatever point of view we may approach the subject. No one who will seriously consider the matter can fail to realize this fact. Unfortunately the average citizen seems not to give the matter serious attention. He regards the public works of the city where he lives as a matter of course, requiring no interest or attention on his part, unless they happen directly to affect his property or to increase his taxes. Like the dwellers at the foot of a slumbering volcano, he becomes unmindful of its rumblings and warnings because they are common, everyday affairs, that do not challenge his attention. His mind becomes callous to danger and even to death so long as it does not come home directly to him or his, particularly if the approach of danger is insidious or unobtrusive. Hundreds of his fellow-citizens may be dying as the direct result of causes which he can help to prevent, and which it is the duty of the municipal corporation, of which he is a part, to prevent, and yet he stands idly by without raising a voice in protest or a hand in defence. If it were known that some dire calamity threatened to

visit the city of Pittsburg at a stated time, in which half a thousand of her citizens might perish, is it supposable that every resource of the municipality and of its citizens would not be exerted to the utmost to ward off the danger? Would not every question of cost, of law, of politics, and of expediency be cast aside if necessary, until the public safety were provided for? And yet, in that city, where over four hundred people die annually from a disease that is as surely preventable as famine, we have the spectacle of city officials, politicians, and quibblers over things comparatively unimportant, delaying, for this reason and that, the construction of a public work to supply the pure water that would remove entirely, or would at least reduce to an insignificant minimum, the cause of the great mortality, while the citizens stand by, idle spectators of acts which lack only the element of motive to become heinous crimes. That unfortunate city is not singled out as an only offender against the life, health, and welfare of its citizens, but merely as a conspicuous example at this particular time (April, 1902).

It cannot be too strongly impressed upon the minds of the public, that every citizen is morally guilty of complicity in crime when he stands quietly by while his neighbors are robbed or murdered, without his active protest and interference, whether the perpetrators be highwaymen or be city officials, otherwise respectable. This is strong language, but any one who soberly considers the facts must agree that it is fully warranted. Even if duty is disregarded, it would seem that not only personal interest, but public spirit and local patriotism would impel the citizen to take a deep and active interest in matters which

so surely and inevitably affect the prosperity of the city or town in which he lives.

The principle of the individual responsibility of the citizen must lie at the foundation of all schemes of reform and improvement in municipal government. So long as the elector is careless and indifferent, the elected officer can scarcely be expected to be otherwise. When the individual citizen demands that the public works of a city shall be administered upon a high plane of efficiency, the demand will be met and enforced. It is therefore one of the most important duties of urban citizenship to take an active interest in municipal public works, and to give them a proper share of careful attention and best thought. If this duty were more generally discharged, one of the first results that might be expected would be the selection of a higher class of officials to whom must be intrusted the construction and operation of these public works; men who would appreciate the dignity, the importance, and the responsibility of the positions they occupy, and who would bring to their work not only the necessary ability, but a full realization of the obligations imposed upon them.

That the average city official does not appreciate the responsibility that he takes upon himself in accepting public office is as obvious as it is deplorable. The fact that this responsibility is shared with him by fellow-officials equally careless of the public welfare may help to account for but cannot excuse his own disregard of duty. If he would stop soberly to consider the extent to which not only the material and financial interests of the community, but the happiness, the health, and even the lives of a considerable number of his fellow-citizens are affected

by the fidelity, skill, and business ability with which the public works of a city are conducted, it would seem that he could not escape a sense of duty and responsibility that is now rarely found among municipal officials.

In the face of such responsibility no right-minded man will solicit or accept office from motives of political power or personal gain alone.

CHAPTER II

MUNICIPAL ORGANIZATION

THE question, What is the best form of government for municipalities, has received a great deal of attention in recent years. A number of different systems, with various modifications, have been proposed, and some of them have been tried, or are being tried, with various degrees of success. I have no intention of entering into the general discussion of the subject. For our present purpose we are interested only in that branch of it relating to the organization, construction, and management of municipal public works.

While one form of municipal government may be distinctly better than another, the idea that seems to be held by many good people that the enactment of improved laws will of itself bring about the regeneration of municipal affairs is sure to prove misleading. The most clumsy and inadequate system of laws and organization cannot prevent good municipal administration, though it may make such administration more difficult and laborious. On the other hand, the most complete and perfect system that can be devised will not of itself provide a remedy for stupidity, inefficiency, and dishonesty among municipal officers. Whatever may be the safeguards against ignorance and carelessness, or the penalties against dishonesty and corruption, provided by the laws, men will, if they

are so inclined, find ways to disregard or to evade them. We must, therefore, rely upon the personal intelligence, capacity, and integrity of the men we intrust with the administration of our municipal business. It is not intended to discourage efforts to improve municipal law and organization. On the contrary, such efforts should be stimulated in every practicable way. Undoubtedly great improvements can be made in even those systems which are now considered most nearly ideal. Every measure that will tend to simplify and facilitate the practical conducting of works of public improvement, or that will provide greater safeguards against carelessness or corruption, should be welcomed by every good citizen. But legislative enactments cannot, alone, be relied upon.

One principle seems to be generally accepted among practical as well as theoretical students of municipal government; namely, that the legislative and the executive departments should be independent of each other. We need not stop to review the arguments for or against this proposition, as the subject has been widely discussed, and may be regarded as settled. The practical application of this principle is much easier in the larger than in the smaller cities and towns, where the simplest form of government is desirable, if not essential. The practice of uniting in one body all the functions necessary to control works of public improvement is too deeply rooted in the smaller municipalities to be readily or quickly changed, however desirable such a change might be. We shall therefore probably continue to have a single body — the Council or its equivalent — both enacting the legislation for and controlling the execution of public improvements.

The more ideal plan of separating the two departments can, however, be approximated in practice, by giving the proper officer of the council — usually its engineer — a free hand in carrying out its enactments. Assuming that such officer is competent and trustworthy (and no one ought to be employed who is not), this should always be done. In the larger municipalities, where a somewhat more complex government is possible and practicable, the two departments should be created and maintained separate and distinct from each other.

Our present inquiry relates more directly to the executive department of municipal activity, — the department charged, after the necessary legislation is provided, with the design, construction, and maintenance of the city's public works. Two general schemes for the organization of such a department have been advocated and are now quite widely in use. In the one most common, the duties of the department are intrusted to a Department of Public Works, the head of which may be a single individual, or a board of two or more individuals, who assume the whole responsibility for the conduct of its affairs. They appoint the heads of such sub-departments as may be created, and control the entire personnel of the organization. In the second, the Mayor is made the executive head of the department, and he must assume the ultimate responsibility for all its acts. He appoints the heads of departments, who report to him and act as his advisory board. The details of this system are so generally understood that I need not go into them here. It is the system now generally advocated for the larger municipalities, and is in successful operation in a number of them, but its

unsatisfactory working in at least one large city offers additional proof, if any were needed, that dependence cannot be placed on the most perfect system unless it is supported by good administration. One of the strongest arguments in its favor is that it concentrates authority and definitely places responsibility upon a single officer elected directly by the people. This argument applies equally, so far as authority and responsibility are concerned, to a single-headed department of public works, whether the position be filled by election or by appointment. On the other hand, it is claimed, and not without a show of reason, that where the executive head is a body of two or more persons, their collective judgment is more likely to be correct than that of a single individual.

The qualities of mind needed in the executive head of a department of public works are, first of all, integrity and executive capacity. He should be a man capable of managing business enterprises upon business principles and by business methods. He must therefore be a man of sound judgment and strong character, equable and diplomatic in temperament, and a good judge of men and of human nature. He must have the ability to decide rightly and the firmness to stand by his decisions when made. He should have had experience in public affairs and business enterprises. Technical education or training is not essential, though very desirable. There seems to exist, unfortunately, a prejudice against professional or technical men for positions of executive character, that is not justified by experience. To assume that a man is fitted for executive work solely because he possesses technical knowledge or experience is to

make a grave mistake; to assume that he is not a capable executive because of his technical training is to make a still graver mistake. Executive capacity is a quality of mind that cannot always be acquired, though it may be greatly developed by education and experience. But assuming that it exists, a thorough knowledge, technical or otherwise, of the particular work to be done, must be of great value to any executive officer. It is a sufficient answer to the charge that technical or professional men are not competent as executives, to point to the almost innumerable positions of that character successfully held in the business world by that class of men.

The position of Director of Public Works is not one for the professional politician unless he possesses the requisite special qualifications, which many of them do, being generally men of affairs; nor for the partisan favorite who is entitled to reward for political services; nor for the worthy incompetent who may need the salary; nor, unless they have the necessary ability, for the brother, uncle, cousin, or aunt of any magnate among the powers that be. It is a position that should be filled upon sound business principles, just as a business man would fill the position of manager of his works. These are trite observations, but we see them so frequently disregarded that their repetition can do no harm.

The position of legal counsellor, during the preparations for and the construction of public works, is one of very great importance. In many cities of the smaller class it is not unusual, from motives of economy, for the office of corporation attorney to be filled by a young and comparatively inexperienced lawyer, or one of mediocre

attainments, whose ability may be quite sufficient for the ordinary routine business. But when ordinances are to be framed for the expenditure of large sums of money, or when important legal questions arise during the progress of costly public work, it will usually be found profitable in the end to have the very best legal advice. If this cannot be supplied by the official attorney of the corporation, special counsel should be employed whenever the occasion requires.

Unquestionably the most important city official in the municipal public works department is the City Engineer. Upon his ability and faithfulness must depend in a large measure the proper design and the efficient execution of public work, and therefore great care should be exercised in his selection. To whatever extent politics and partisanship may be allowed to prevail in the appointment of other city officials, they should be rigidly ignored in filling the office of City Engineer. The writer does not wish to be understood as condemning in general the introduction of politics into city government. In so far as political parties represent well-defined principles and policies in the conduct of public affairs, they are to be encouraged. It is only through organized effort that measures of public policy can, as a rule, be carried into effect, and as it is not usually practicable to effect a separate organization for the conduct of public work alone, the best results must continue to come, as they have heretofore come, from utilizing established political parties for the purpose. But the practical application of this principle has its limits, and the line should be sharply drawn at the office of the City Engineer. Principles and policies of

public improvement having been decided on, politics should have nothing to do with their execution. Fitness for the position, regardless of the party affiliations of the candidate, should alone control the appointment. It may be said to the credit of city engineers that as a rule they are not active political partisans, and that they are governed in their conduct by duty and not by political considerations. Furthermore, the position should not be subject to frequent change depending upon the ascendancy of one or the other political party. The carrying out of a definite scheme of public improvements is necessarily the work of years, and the City Engineer who plans and inaugurates it is, other things being equal, most competent to carry it to completion. He becomes familiar with all the details of the problems involved, and has the benefit of accumulating experience as the work progresses. Frequent changes in the office must necessarily introduce elements of inexperience and confusion, and may interfere with that continuity of plan and purpose and interest which are essential to the successful carrying out of important enterprises. Among the most efficient and successful city engineers will be found many who have grown up in the office, have begun in a very subordinate position, and have been gradually advanced to the position of chief. Such men have an intimate knowledge of facts and details, which can hardly be acquired in any other way, and which is most helpful, if not absolutely necessary, in managing the affairs of the office. The essential qualities in an efficient City Engineer are: first, absolute honesty and integrity, supplemented by other essentials of good character that will merit and command the full confidence

of his official associates and of the public at large; second, a good working command of the technical knowledge of the profession, supplemented by experience. It is not essential that he shall be an expert or a specialist in any one or more departments of municipal engineering, for such expert ability can be obtained through and is the special province of the Consulting Engineer, of whom something will be said further on. Third, he must be a man of decisive character, strong will power and persistence of purpose, having a large endowment of that quality popularly known as "backbone." The man who is lacking in these qualities, who is vacillating and easily swayed by this and that adverse influence, is out of place in the office of the City Engineer, whatever other good qualities he may possess. Fourth, he must be earnest, active, industrious, diplomatic, and devoted to his work and to the interests of the city. In the larger cities, where the engineering staff is necessarily extensive, the duties of the City Engineer are largely administrative, and it is important that he be a man of good executive capacity.

Having secured a proper man for the position, it is essential that he should have a free hand in dealing with the matters that belong exclusively to his department. First of all he should select and nominate all his assistants and subordinates, subject, it may very properly be, to the approval of his executive superior, whether it be the City Council, or the Board or Commissioner of Public Works. The principle of undivided responsibility in the administration of any department is so well understood that it need not be discussed here. The City Engineer should be held to a strict accountability for the official

conduct of his subordinates and the efficient management of his department. But this would be manifestly unreasonable and impossible, unless he is allowed to select his staff from top to bottom. Those who have the best opportunities for knowing the facts will confirm the assertion that much of the inefficiency and incompetency, to say nothing of more serious delinquencies, that are sometimes found to exist in the engineering department, are due in a large measure to the fact that assistants and subordinates are forced upon the City Engineer regardless of their fitness, and, being so appointed, feel that they are in a measure independent of his authority, and lack that loyalty to him which is an absolute essential to the proper conduct of the work of the department.

It is not out of place here to say that when the proper man for the position is found, he should be paid a salary commensurate with the character and importance of the work he is expected to do. It is a fact, not very creditable to municipal government, that no class of professional men are, as a rule, so inadequately paid as city engineers. And if the talent found in that office is often open to criticism, it is largely due to the fact that the salary paid does not command the services of more competent men. If able and efficient city engineers are wanted, they are readily obtainable if adequate compensation is offered. Considering the important character and the financial magnitude of the work they are to manage, and the difference in economy and efficacy that may, and often does, result from good as compared with bad engineering, there can be no doubt that competent engineering is cheap at any price, and that incompetent

engineering is expensive even if obtained without any compensation.

The employment of the Consulting Engineer on municipal public work is not as common as it should be, nor as the value and importance of his services would justify. A consulting engineer may be defined as a member of the profession whose wide experience in, or exhaustive study of, one or more departments of professional work renders his counsel or advice of special value in those departments. It is not far out of the way to say that he is to the engineering profession what the specialist is in medicine, or the counsel is in law.

In this age no man can master all the details of, or acquire the highest degree of knowledge and skill in, every department of any profession or business. When an engineer has, in addition to marked ability and a wide experience, devoted himself to the study and practice of some special branch of the profession, it must be evident that his judgment and skill in dealing with problems in that branch are sure to be of a higher order and of more value than can be looked for in the ordinary practitioner, whose multiplicity of duties limits the time and attention he can devote to any one special subject. The average city engineer is generally burdened with more work than he can possibly perform with that care and thoroughness he would desire, and must divide his time and attention between the problems of sewerage, water supply, street paving, street lighting, and the numerous other kinds of municipal work that fall to his department. It would be unreasonable to expect him to bring to the study and practice of any one of these things the knowledge and experience of the specialist.

At the same time there is no field of human effort where the highest skill and judgment are more needed, or where more may be accomplished by their exercise, both in economy and efficacy, than in these problems of municipal public improvement. This fact is not always immediately apparent, because errors of skill and judgment in the design or execution of public work may pass unnoticed for years, and there is no ready method of ascertaining whether a certain piece of work might have been accomplished by more economical methods without in any way decreasing its value or utility. Could all the facts be known to the public, the necessity and the economy of securing the best possible expert ability on even the ordinary everyday work of the average city would be so apparent that the employment of the Consulting Engineer or expert would become the rule and not the exception. This is a strong statement, but the facts fully justify it. It is not intended to disparage the ability or the work of city engineers, the most competent of whom will be found to indorse these views and to advocate most strongly the wisdom of employing special counsel in at least all the more important municipal enterprises.

A recent illustration of this fact is afforded by the example of a large city engaged in a work of great importance — the chief engineer of which is a man of very high reputation and ability in the profession — where two eminent consulting engineers are employed on a liberal salary, to whom all the important questions, and many of the details besides are submitted for examination and approval. Even in those cases, not infrequent,

where the chief engineer is fully the equal of the Consulting Engineer in competency and special qualifications, there is great advantage in having the result of their combined skill and judgment in all important questions that may arise. No man, whatever may be his ability and special training, is infallible, and the fact was very early discovered that "in a multitude of counsellors there is wisdom." Even in the Supreme Court of the United States, whose members represent the highest judicial standard, it requires the concurrence of more than one judge to make a decision effective. It would seem, therefore, to be a wise policy on the part of municipal governments to resort to the employment of consulting engineers much more frequently than is now the practice. A retainer, moderate in amount as compared with the value of the results attained and the money that might be saved, would secure the counsel of competent specialists in each department of municipal work. The responsibility that must be assumed by the public works officials, as well as the City Engineer, in planning and carrying out public enterprises costing large sums of money, is necessarily very great, and any expedient that will assist them in discharging that responsibility should be welcome. The additional confidence that the public would feel in plans approved and carried out under the advice of the best obtainable authority on the subject, would often be of material advantage, aside from the personal satisfaction and confidence it would afford the officials themselves in bearing their responsibilities.

Little need be said of the direct assistants of the City

Engineer; their employment and control may be safely left to him.

The function of Inspector on public work is a very important one. He is supposed to be the immediate representative of the City Engineer, and therefore of the corporation, in seeing that work is done in accordance with the contract and with the instructions of the City Engineer. His duties are of the first importance. Upon his honesty, watchfulness, faithfulness, and loyalty must necessarily depend, to a large degree, the good or bad quality of the work done. In the great cities, where a large amount of work, scattered over a wide territory, is in progress, it is obviously impossible for the City Engineer, or his immediate assistants, to visit the work very frequently, and to give that close and constant attention that is usually necessary.

Notwithstanding the importance of their duties, it is safe to say that no class of city employees is selected with so little care as are inspectors. They are frequently appointed by the council or the mayor, or some other city official, for personal or political reasons, and with little or no regard to their special fitness for the work they are to do. It is not even very unusual for them to be appointed upon the suggestion of the contractor, whose object is not always to protect the interests of the city. When so appointed they can hardly be expected to be wholly devoted to securing honest compliance with the contract, or entirely loyal to the engineer. Perhaps in no one thing is the usual conduct of municipal public works so open to criticism as in the appointment and control of inspectors. The

qualities absolutely necessary in an inspector of public work are, first of all, honesty and loyalty to the interests of his employer; second, a thorough practical knowledge of the particular kind of work he is to have charge of, backed by a good supply of that not overabundant quality, "good, hard common sense"; and, third, industry and fidelity in attending to his duties. How far the average inspector on municipal work falls short of these standards is notorious to every contractor and to most city engineers. Too often he is some broken-down politician or political worker, or gambler, or a specimen stick from the driftwood always floating about every city, who has failed to make a living in any other way, and who has secured his position through some mysterious "pull" with the appointing officials. He is "on the make," and blackmails the contractor shamelessly. He is the best friend of the dishonest contractor, and does not hesitate for a paltry bribe to overlook or to wink at violations of the contract, which may save the contractor thousands of dollars, but may, eventually, cost the city ten times as much.

This is a dark picture, but it is only an outline, and might be filled in with details, based on facts in the personal knowledge of most contractors, that would make it appallingly black. It is not asserted that all inspectors on public work, even among those who secure their appointment by questionable methods, are incompetent or dishonest, but those who have had most experience with city public work will bear out the assertion that competent, fearless, and honest inspectors, who will not overlook defective work for a consideration, are in a hopeless minor-

ity. With such inspectors over public work being done by an unscrupulous contractor, the city is sure to be defrauded to the extent of a thousand times the meagre pay usually allowed this class of employees.

Inspectors should be appointed by, and be subject to, the authority of the City Engineer alone, who may then be held responsible for their official action. Knowing the importance of their work, he will naturally be very careful in their selection, and very watchful over their conduct. As a rule the best inspectors come from the ranks of trained mechanics in the line of work they are to oversee. Thus, other things being equal, a well-trained and skilful mason makes the best inspector over masonry work. His practical experience enables him to judge of the relative importance or unimportance of details, and to insist on essentials while disregarding the small things that are of no practical importance. The practice of employing young men just out of the technical schools cannot be recommended. While they are generally faithful, watchful, and honest, their lack of practical knowledge and experience places them at a great disadvantage. In their commendable zeal to secure exact conformity to specifications, they are likely to insist on technical compliance with unimportant requirements, under conditions where it is unnecessary or impracticable. Their lack of practical experience does not enable them always to discriminate between essentials and non-essentials, or between the practical and the impractical.

The writer recalls an inspector who served under him many years ago, on a very important and rather difficult piece of bridge masonry. He was a man of more than

average mental calibre and of great good sense. He was by trade a mason and a thorough master of his business, and knew perfectly the qualities of material and the kind of work necessary to turn out a good job. He comprehended the character of work the specifications were intended to secure, and knew what requirements it was necessary to enforce under all conditions, and what might, under unforeseen circumstances, be varied from, without detriment to the work. While not a mere stickler for technical adherence to every clause of the specifications, he insisted on every essential requirement. With the confidence of a master of his business, absolutely honest, and at the same time reasonable and diplomatic, he was respected and obeyed by contractor and workman alike. His inventive mind and practical knowledge enabled him to make many valuable suggestions in the management of the work, and thus to be of real assistance to the contractor, who came to regard him as a friend rather than as an enemy. Such inspectors are, unfortunately, not often found, but they furnish an ideal standard to be approached as nearly as may be.

CHAPTER III

PREPARATIONS FOR MUNICIPAL WORK

PROJECTS for municipal public work should be carefully worked out, and all necessary preliminary preparations therefor made with deliberation and thoroughness. Hasty and inadequate preparation is often responsible for the trouble, vexation, and excessive cost that so frequently attend the prosecution of such work. Ill-considered plans will often be hurriedly offered to accomplish some purpose, or to meet some public emergency, which, upon careful and mature examination, will be found to afford an unsatisfactory or inadequate solution of the problems to be solved. Projects will be proposed under the guise of public utility and pressed for hasty approval, which will appear, when carefully examined, to be largely schemes for private gain. Some necessary improvement may have been deferred until an emergency seems to make it important to proceed with the work, without giving the matter the careful preliminary investigation essential to its success. These and many other conditions may arise to tempt city officials to hasty and ill-considered action, but the temptation should be resolutely resisted until the necessary investigations can be made and the plans developed. Emergencies which require immediate action should be provided for by temporary measures until permanent plans for relief can be perfected.

This is a much wiser course than to saddle the municipality with imperfect and unsatisfactory public works, constructed at great expense, which, once installed, must be put up with for a long term of years. One result of precipitate action is to deprive the engineering department of the time and opportunity necessary for working out in the proper manner the solution of problems involved, for studying their cost, and for preparing estimates of that cost which will prove approximately correct. A striking illustration of this was afforded by the action of the legislature of the state of New York in ordering improvements amounting to the practical reconstruction of the state canals, and appropriating a large sum of money therefor, upon estimates of the state Engineer and Surveyor which he was compelled to make from insufficient data and within an altogether inadequate time. As might have been anticipated, these estimates proved to be erroneous and misleading. They were really not entitled to be called estimates at all, being rather rude guesses, based upon supposed conditions. The lessons of that misadventure are so fresh in the mind of every one that it is unnecessary to enlarge upon them here. The appropriation was exhausted before the contemplated work was more than half done, the work was suspended, the air was full of charges of fraud and scandal, reputations were smirched, and the state was involved in lingering and expensive efforts to cancel and settle up uncompleted contracts. Investigation failed to sustain the charges of fraud and corruption, and the real and only serious wrong-doing in the transaction seems to have been the inexcusable haste and unprepared-

ness with which this project to expend many millions of dollars was entered upon. It is not too much to say that such examples are common in the history of many cities, though on a smaller scale.

The public and many city officials do not seem to understand or realize that the proper preparation of any project for public improvement requires considerable time for the necessary preliminary work. There is nearly always more than one solution for problems of municipal improvement, and much latitude for varying details when the general solution has been arrived at; and time and opportunity should be given for working these out in the best manner. For these reasons any project for public work should be inaugurated as long in advance as possible, so as to give ample opportunity for mature consideration and preparation.

Early consideration should be given to the means by which the money is to be provided to meet the expense of contemplated improvements. The funds to pay for municipal public work are raised in a variety of ways, the principal ones, in the order of their common use, being: the sale of municipal bonds; special assessments; and ordinary taxation.

The method of issuing bonds has much to recommend it if kept within proper bounds. It enables the corporation to raise means quickly to carry out needed improvements, and with a proper sinking fund provision the burden may be distributed over a considerable period of time, so that it will not be seriously felt by the public.

The improvements made with the proceeds of the sale of bonds should be, and usually are, of a permanent character,

and the benefits will extend over a considerable period of years, during which the population and taxable values are likely greatly to increase, making the burden lighter, and compelling those who come after the completion of the work and enjoy its benefits to participate in paying for it. But the method is also attended with dangers. If the corporation enjoys high credit and its bonds can be readily sold for, or above, their par value, there is danger that the ease with which funds may thus be provided may encourage unnecessary or reckless expenditures to an extent that may seriously cripple the credit and prosperity of the municipality in the future, by rendering the burdens of taxation excessive. The provision in most states that the bonded debt may never exceed a stated percentum of the total assessed valuation for taxation, is a very wise and salutary one, but it is often evaded on various pretexts. The temptation to overload the municipality with bonded indebtedness is greatly increased by the fact that the burden of meeting it is shifted from the present to the future, and need not greatly worry the taxpayers of the present. The only safe course is to restrict the issue of bonds rigidly within limits which experience has shown to be prudent.

In prescribing a limit for the amount of bonded indebtedness which a municipal corporation may incur it is, however, desirable and proper to discriminate between actual indebtedness which must ultimately be met by ordinary taxation and that class of indebtedness, or rather investment, for which a means of liquidation is provided independent of ordinary taxation. Thus, if a city has incurred a debt to construct its own

water-supply plant, which it operates under its direct control, collecting for the service water-rates which yield sufficient revenue, not only to pay all operating expenses, but to meet the interest on the debt created for construction, and to set aside a sinking fund that will extinguish the debt when it falls due, that debt may, with reasonable safety, be excluded from consideration in any legislative act limiting the indebtedness of the corporation. In the same way indebtedness created by issuing bonds to meet immediate payments for work the cost of which will ultimately be paid from special assessments should not be considered as augmenting the real indebtedness of the corporation in so far as these special assessments may be counted upon as being sure of collection. In this case, however, it is well to err on the safe side, as such assessments are subject to some contingencies, and it is safest to consider that a part, at least, of them will fail of collection.

It must be remembered, however, that fortuities may occur in the best planned and most promising projects, through the operation of which responsibility for the debt incurred may be thrown back upon the taxpayers, and that, therefore, such obligations should not be incurred without very careful consideration and prudent provision for contingencies.

The method of raising funds by special assessments is of so much importance, and the principles involved so imperfectly understood by the public and many municipal officers, that a separate chapter will be devoted to that subject.

A popular and meritorious method of providing the means for carrying out some kinds of public work consists in a combination of the bond and the special assessment plans.

The immediate cost of work which may properly be paid for by special assessments is met by the issue and sale of bonds for that specific work, running for a limited period of years. The total sum chargeable to any taxpayer by special assessment is divided into as many equal sums as the bonds run in years, and one of these sums, together with a sum sufficient to meet his share of the interest, is collected from the taxpayer annually in the same manner as other taxes are collected, the liability thus created against the assessed property being made a first lien upon it, ordinary taxes alone taking precedence. The money thus realized is either applied directly to the purchase of an allotment of the bonds, or is placed in a sinking fund for taking up the bonds at maturity, so that the temporary debt assumed by the municipality is met and extinguished without cost or serious inconvenience to it. By this plan most of the advantages of each method are realized, and the objections to each are mostly avoided, since the courts have, I believe, usually held that bonded indebtedness of this character should not be included in determining the bonding limit of the municipality.

The most serious danger in the employment of this system arises from the possibility that taxpayers thus specially assessed may successfully contest the validity of the special assessments on various grounds, in which case the municipality is left to bear the burden of redeeming the bonds. A conspicuous example was afforded, a

few years ago, by the very disastrous experience of certain New Jersey cities, where miles of unnecessary pavement had been constructed, the cost being assessed against the abutting property, but directly paid for from the proceeds of bonds issued for the purpose. The property owners successfully contested the assessments, and the result was the forced bankruptcy of the municipalities. Many cities have thus been forced to assume heavy financial burdens, and the lesson such cases teach should not go unheeded. Where, however, proper prudence and caution are exercised, the percentage of defaulted payments on special assessments should not be greater than upon ordinary taxes. Various devices to escape this contingency have been resorted to in different cities, such as: that the city shall be held liable for payment of the bonds to the extent only of the receipts from special assessments; that the contractor for the improvement shall be paid in these bonds and shall look to the collection of the special assessments alone for their redemption; that the corporation shall issue, in lieu of bonds, in payment for the work, certificates of indebtedness against the property or the taxpayer benefited; and other provisions of like nature. Such provisions serve only to shift the responsibility for the collection of the assessments from the municipality to some one else, usually the contractor, who in turn, as compensation for the risks thus taken, adds what he deems a safe insurance to his price for doing the work, thus in turn reshifting the obligation to the shoulders of the municipality or the taxpayers. It is, therefore, very important, where special assessments are to be imposed, that the very greatest care shall be taken to provide

against any possible loophole through which the person assessed may escape payment. Where for any reason there is room for doubt or uncertainty upon this point, it is better to discard the method altogether, and, if necessary, to postpone indefinitely the carrying out of the work.

Other things being equal, the safest and best method of providing means to pay for public work is from the general funds raised by taxation in the ordinary way. Where this is done the credit of the municipality cannot be impaired, and the temptation to reckless and unnecessary expenditure is almost certain to be effectually resisted. But unfortunately the "other things" alluded to are usually not equal, and it is found impracticable to carry out, efficiently, systems of public improvement where current taxation must be depended upon to meet the cost of them. One condition of carrying out in the most efficient and economical manner any large public work is that it shall be prosecuted consecutively as a whole, and completed without unnecessary delay, and this is usually impossible where the municipality must depend, for means of payment, on funds available from ordinary general taxation. Where the greater part of the cost of the improvement may be met by special assessments, the municipality's share may be paid from the general funds; but it remains true, as a general proposition, that it is impracticable to depend on ordinary taxation for the means of prosecuting public work. Wherever it is found practicable, however, it is without doubt the safest and most prudent plan to follow, and should be adhered to if possible.

Wherever any public municipal improvement is contemplated, its plan and scope should be carefully studied. Assuming that its necessity and utility are fully demonstrated, and that the means for carrying it out can be provided, it remains to consider how the object aimed at may be best and most economically attained, the present and future interest of the public conserved, the special conditions that may exist be met, the best general plan selected, and, finally, the necessary details worked out. It is very desirable that a general scheme of public improvements should be planned, if possible, before the separate portions of it are laid out. Thus, the streets of a city must, in addition to their special function as avenues of communication, be utilized for carrying sewers, water mains, electrical conduits, street railroad tracks, etc., and if a general scheme for the relative location of these various things can be adopted at the beginning and provision be made for them, a great deal of trouble and expense may be avoided as the development progresses. In our rapidly growing American cities it is often difficult to foresee and provide for the requirements of the future; but it is often possible to design works needed at the present time in such a manner that they will become harmonious parts of the larger systems, which the growth and development of the city may make necessary in the future. It is too often the case that the present temporary requirements alone are considered and provided for, and when extensions and enlargements become necessary the older work must be modified or entirely discarded and reconstructed. This cannot always be avoided, but might be in many cases, if proper foresight were exercised.

In planning projects for public works, the experience of other cities where similar problems have been worked out should be investigated. In this way very valuable information may be obtained. It is a maxim of systematic inventors that when a new or improved device or process is contemplated the first thing to be done is to investigate "the state of the art,"—to find out what has already been done or attempted in that particular field. If city officials were careful to pursue the same plan in devising public works, the public would be greatly benefited, and some costly mistakes would be avoided. Time and money spent in such investigation is always well invested. The practice of sending committees to other cities to study their improvements and methods deserves, therefore, to be encouraged. Unfortunately, the public usually looks with disfavor upon these "junketing expeditions," as they are popularly called. While it is undeniable that in too many cases these visiting trips have been undertaken for pleasure rather than for serious study, and that the visitors have been entertained rather lavishly by their hosts, the popular prejudice against them is neither warranted in theory nor justified in practice. The fact that such visits may, and too often do, degenerate into little more than junkets is not a valid argument against their general utility. When undertaken with the proper motive and carried out in a proper manner, they nearly always yield valuable results, worth to the municipality far more than they cost. The ideal city official must keep abreast of the best theory and practice in municipal business, and particularly in that department of it for which he may be

more directly responsible, and in visiting and studying the methods of other cities he will be sure to pick up items of information that can be utilized to the advantage of his own work.

In this connection the societies or associations of city officials, a number of which have been organized in this country, cannot be too highly commended. They are doing a very valuable work, and should be heartily encouraged and sustained by every municipal corporation. Their conventions and transactions have created a spirit of investigation and emulation, and have done more towards the elevation of the plane of civic standards than any other single agency. The papers and discussions that come before the meetings and are printed in the transactions are a storehouse of data and experience of the greatest value. These meetings bring into personal contact the most earnest and able men from all departments of municipal government, who compare notes, exchange ideas, and discuss results. The value of the intellectual and moral stimulus resulting from such personal contact and association cannot be overestimated.

It is trite to say that public work should be planned and executed upon the same principles that a careful, wise, and far-seeing business man applies to his personal business. The questions that the prudent business man will consider when any addition to his business or his plant is contemplated are: Does there exist a necessity for the proposed expenditure? Have I, or can I procure on reasonable terms, the means to carry out the proposed improvement? If I must borrow the required money, can

I pay the debt when the loans mature? Will the proposed improvement answer the purpose for which it is intended? And, finally, — the crucial question, — Will it pay?

The necessity for a proposed public work is usually sufficiently apparent. The necessities of every city are quite certain to outrun the ability to meet them. The financial resources and the state of the credit of the city will afford an answer to the second question. The third requires much more careful consideration, though it usually receives less than either of the others. Judging from the action of the average city council, one is forced to conclude that the question of how a bonded debt incurred for public work is to be met when it matures gives very little concern. There is, it is true, some excuse for this unconcern, because the prosperity and rapid growth of our American towns and cities tends to make it comparatively easy to meet such obligations when they fall due; and if for any reason it is not convenient to pay off bonds when they mature, it is nearly always possible to refund them on favorable terms. It therefore usually happens that if the bonded indebtedness of a municipal corporation is kept within reasonable grounds, little difficulty is found in taking care of the debt when it falls due. It is hardly necessary to say, however, that such careless disregard of what are admitted to be sound business principles is not good public policy. Prudent financiering demands that whenever a debt is created, provision for meeting that debt when it matures shall be simultaneously enacted. The usual and most satisfactory way of doing this is to establish a sinking fund, so adjusted that it will amount to a sufficient sum when the debt matures to pay it off.

Not only is the creation of such a sinking fund dictated by prudence, but it will usually be found profitable. Notwithstanding the high credit enjoyed by our American municipal corporations, even where their indebtedness is secured only by the business honor of the corporation, that credit would be, and the facts prove that it always is, enhanced by the knowledge that provision is being systematically made to meet all obligations when they mature. Bonds backed by the creation of an adequate sinking fund will nearly always sell for a price sufficiently higher than they would otherwise bring to make the creation of the sinking fund profitable as well as prudent. Another thing in its favor is the fact that the necessity of supporting the sinking fund from current taxation tends to hold in check the reckless issue and sale of bonds for extravagant public works. When a temporary debt is created, to be taken up from the proceeds of special assessments within a limited time, a sinking fund is, of course, unnecessary; but in all other cases where bonds are issued, they should be secured by the creation of a sinking fund, which should be held inviolate for its intended purpose. A common objection to sinking funds is that their operation places an undue burden on present taxpayers, but this need not be so, since payments to the fund may be arranged on a sliding scale, beginning with easy contributions and gradually increasing in the anticipated ratio of the growth and wealth of the corporation.

The question, "Will a public improvement pay?" cannot be considered in quite the same way as a business man would apply it to an addition to his business plant. The

business man would reason on the basis of prospective commercial profits alone, while the construction of a public work often involves the supplying of some necessity or convenience of the population the value of which is not exactly measurable in commercial terms. It is rather analogous to the necessary expenditure the business man must make to supply the physical requirements of himself and his family. In this aspect the question becomes, "Is the expenditure justified by the existing necessities?" rather than, "Will it yield a profit?" In the final analysis, however, both questions mean practically the same thing. The necessities of existence must be supplied in order that a man or a municipal corporation may be successful and prosperous, and in this sense necessary expenditure, provided it *is* actually necessary, must be profitable. But the popular standard of necessity is elastic, being measured by habit, and by the ability to supply what is regarded as necessary. Consequently, there is room for quite a wide difference of opinion as to the necessity, and the consequent advisability of any certain public work, and the question of whether it will pay to carry it out will depend on one's opinion of the urgency of the necessity. If the contemplated public work involves questions of human life and health, its urgency should be considered very great. If, for instance, the water supply of a city is polluted and it can be reasonably predicted that the procurement of a supply of pure water would materially prevent sickness and reduce the death-rate among the inhabitants, the expenditure of the money necessary to improve the water supply will be justified not only upon humane grounds, but by sound business principles.

There are, however, not a few public improvements to which the commercial standard of utility and profit may be directly applied, and their advisability judged thereby. Street pavements are an example. Whatever æsthetic arguments may be presented in favor of paving a street, the real question is whether it will pay as an investment. For country roads through very thinly settled regions, a proposition to pave the roadways would be in the highest degree absurd. All that the business transacted over them will warrant is the cutting down of the trees and the removal of stumps. As the country becomes more densely populated, and travel and traffic increase, the farmer finds it profitable to drain and grade the roadway, because he can then haul heavier loads and make better time. A still further increase of traffic makes a well-constructed macadam roadway desirable, because, principally, it is found profitable. In the larger towns and smaller cities something better than the macadam is warranted, because the volume of travel is such that it pays to reduce still further the expenses of street transportation. In the heavy-travelled business streets of the larger cities the aggregate economy resulting from reducing the resistance to drawing heavy loads makes the best and smoothest pavements profitable, even if they are very expensive to construct and maintain. When it is considered that one horse will draw over a good asphalt pavement a load that it would require at least two horses to haul over a good macadam road, it is not difficult to realize that the one may be a much more profitable investment than the other, even if the first cost of the one is two or three times that of the other. The same reasoning applies to the reduction

of gradients on roads and streets. The hill that it would not pay to cut down on streets or roads where the travel is light, becomes such a serious obstacle to heavy city travel that a very large sum of money may be profitably spent to reduce the grade. So with the water supply of a city. The present source may be so located that expensive pumping is required to deliver it into the city mains; or it may be so impure that it cannot be safely used without filtration. It may be possible, by the expenditure of a sufficient sum of money, to obtain a supply that will flow by gravity into the mains, and be so pure that it will not require treatment, and the saving in cost of operation may be so considerable that the additional expenditure for the new supply may be a very profitable investment.

These examples might be extended to embrace all the several branches of municipal public works, but what has been said will sufficiently illustrate what is meant by the the question, "Will it pay?" as applied to the public works of a city. It is a question that should always be carefully considered. Each particular case will often require separate and individual examination, and the services of technical experts may often be required to deal with it adequately; but until it is demonstrated that some pressing necessity will be met, or that the expenditure required will be profitably invested, the improvement will not be justified. Of course there may be reasons other than necessity or direct profit of sufficient weight to justify a public improvement, or the benefits derived may be indirect, but nevertheless real. Thus works of art, public monuments, or public parks and gardens may have a sufficient value fully to warrant their existence. Street

improvements may be extended beyond the point where they are really necessary or profitable at the time, if there is reasonable assurance that new industrial establishments or increased population will be attracted, thus building up the business of the city, and increasing the receipts from taxes.

It must be kept in mind that public improvements are undertaken for the good of the public at large, and not to confer benefits on individuals alone. In nearly every community there will be found persons, or associations of persons, who, largely from selfish motives, clamor, in the name of the public, for improvements which, while not devoid of public utility, would mainly benefit the property of a few individuals. If in such cases the interests of the public justify the improvement, the property of the individuals benefited should be specially assessed for a fair part of the cost. If this were more generally done, city officials would be less frequently importuned to carry out projects of doubtful public utility.

When the general scheme for any improvement has been decided upon, general plans and details and specifications are to be prepared. These come within the province of the engineering department, and need not be enlarged upon here. It should be remembered by his official associates that the City Engineer will require ample time for the preparation of his part of the work. Usually each project will present some special features and some engineering difficulties which will require time to consider and work out. Often special surveys and examinations must be made, systematic observations conducted, which to be of value must extend over considerable

periods of time, and experiments may be necessary to determine the fitness of materials available for the work. The success or failure of the project may depend upon the care with which this preliminary work is done, and no pains should be spared to make it as thorough and complete as possible. Improvements to be made, errors to be corrected, contingencies to be foreseen, and estimates to be revised are much more easily and cheaply worked out in the office and on the drawing table than on the ground after the work is in progress. It almost never pays, as a mere matter of business, however great may be the urgency, unduly to crowd this part of the work.

CHAPTER IV

DIRECT WORK *VS.* CONTRACT WORK

PUBLIC works may be constructed, operated, and maintained either under the direct control and management of the municipality or by contract. Under the first plan the agents of the municipality not only design the work, and prepare the specifications under which it is to be carried out, but they purchase the required materials and employ and control directly the labor engaged upon the work, without the intervention of contractors. It may be called the direct system. In the second, when all preliminary preparations are completed, proposals are asked for from contractors, some one of the proposals is accepted, a contract is entered into, and the contractor supplies the materials and furnishes and directs the labor upon the work, the corporation exercising only general control over it to see that it is done in accordance with the contract. This is known as the contract system.

The relative advantages and disadvantages of the two systems have always been and still are a fruitful source of discussion. On the one hand it is claimed that by the direct system work should be done not only in a better manner, but more economically than under the contract system. On the other hand it is argued that, because of unavoidable conditions, the work can be done equally

as well, and, in the end, more cheaply, by the contract system.

Unfortunately, the results of experience with the two systems are quite inconclusive, when closely and fairly examined. Considerable public work has been carried on in American cities under the direct system, and it has often been claimed that a material saving in cost has resulted. Such claims may or may not be true, but as a rule they cannot be satisfactorily verified. The conditions that affect the cost of any two pieces of public work are seldom, if ever, exactly the same, and consequently they cannot be rigorously compared with each other. The reasons for this are too numerous to mention, but the fact will be apparent to any one who gives the matter close examination. Furthermore, it can never be quite certain that, even assuming that the conditions were identical, the work in the one case was done with exactly the same adherence to plans and specifications, and was of the same quality, as in the other. Nor can it always be determined whether the accounts of cost have been kept on the same basis, or whether all the items of the cost have been charged to the work in each case. It nearly always occurs that where two pieces of public work, apparently quite alike in all respects, have been executed under the same management, — whether of a contractor or of the municipality, — the result will disclose a considerable variation both in the total cost, and in the unit cost of the different items of the work. It is therefore not difficult to account for the contradictory statements of the advocates of either system. Any disinterested person who will attempt to collect the existing data on the subject, and to deduce

therefrom conclusive evidence that one or the other system is the more economical, will find the problem at present practically insoluble.

In the absence of conclusive proof derived from experience, we are thrown back upon a theoretical discussion of the subject, supplemented by such practical data as are available.

The claim that the municipality should be able to carry out its public works under the direct system as well as, and with greater economy than, under the contract system is very plausible. It is argued that the officers of the municipality, having no personal financial interest at stake, can have no other motive than to execute the work in the proper manner, and, other things being equal, it must be evident that the municipality should be able to save the contractor's profit. The argument is sound, but the assumption of equal conditions is delusive. It is not by any means always true that the municipal officials charged with carrying out the work are entirely free from personal incentives to reduce the cost at the expense of the quality of the work, and the "other things" assumed to be equal are, as a matter of fact, never, or almost never, equal.

Granting that the officials charged with carrying out the work are entirely honest, and actuated only by a desire to serve the best interests of the municipality, there will always be a strong incentive, quite proper in itself, to reduce the cost to the lowest possible limit. The motive for this may not be free from personal considerations. The official is naturally ambitious to establish a reputation for economical management and for doing the work at a lower cost than prevailing contract prices,

and he may be unconsciously influenced to secure these results by modifying plans, and permitting a quality of work below the standard originally intended, arguing that it is good enough for the purpose. Those who have observed the progress of public works that are being carried out under the direct system will bear evidence to the assertion that this is not only often, but that it is generally the case. It is not putting the matter too strongly to say that work executed under the direct system is generally carried on with a less strict adherence to the precise requirements of the plans and specifications than would be exacted from a contractor. If any one doubts this let him make a careful examination of any such work that may come under his observation. Whether the work is or is not good enough for the purpose intended, is hardly the question. If in designing the work and preparing the specifications with the view of having it done by contract, certain requirements were thought essential, these requirements cannot be less essential when the municipality may, later, decide to do the work itself. Even when the municipal officials intend to and do make every effort to execute the work in strict accordance with the standard called for by the specifications, they may find it impracticable or impossible to do so. They may not be supplied with the plant necessary to turn out the quality of work intended, they may not be able to command the skilled labor necessary, and they may not have had the practical experience in directing the use of machinery and labor that is essential to produce the best results. Whatever may be the reason, it may be

stated as a fact, without impugning the motives or the ability of municipal officials, that public work done under the direct system does not average better in quality than similar work done under the contract system.

It will usually occur that while the contractor, even of the better class, may be tempted to reduce the cost at the expense of the quality of the work, the municipal officials, having no direct interest whatever in the financial outcome, will insist on strict adherence to the terms of the specifications, so that the quality of the work secured is likely to be at least as good as though the city were doing the work direct.

It would therefore seem to be a reasonable conclusion that under the direction of competent and alert city officials as good work can be secured by the contract system as by the direct system, while under incompetent and negligent officials good work is not likely to be secured under either system.

Nor will the claim that greater economy can be secured under the direct system bear close examination. It is generally true that the successful bidder upon any public work is a contractor of large experience in that particular kind of work, who, as a result of that experience, has acquired more than ordinary skill in its prosecution. His survival in the business indicates that he has the natural or acquired executive capacity successfully to manage work of that character. He is probably equipped with the best plant for the service, and is likely to have at his ready command competent overseers and the necessary skilled labor. If he does not fulfil these requirements, it would be unwise to award to him the contract. Further-

more, contracting for profit being his business, he will give to the work that close and exclusive attention necessary to secure the best financial results. On the other hand it will usually occur that the city official, as, for instance, the City Engineer, who would have charge of the prosecution of the work under the direct system, has been selected with a view to his professional ability rather than his familiarity with, or his executive capacity in the practical management of, construction work; but granting that he is fully qualified in this respect, his other duties, which are usually exacting and require the whole of his time, will prevent him from giving to the work that close and undivided attention necessary to insure the highest economy. Even if he possesses all the necessary qualifications and has ample time to devote to the work, he will labor under serious disadvantages which the contractor would escape. He may be hampered by laws and ordinances, or by the opposition of other officers whose approval is necessary, in securing promptly the required plant of the proper character. It is a well-known fact, the causes for which we need not stop to investigate, that laborers in the employ of municipal corporations are not only less efficient, but that they often command higher wages than those employed by contractors or private corporations. It is difficult in the present condition of municipal government to keep public work under city management free from personal or political influence, and city officials often feel themselves obliged to employ or to retain foremen and laborers whom they well know to be incompetent and inefficient. They are often impelled, for a like reason, to purchase supplies from certain dealers although they could

do better in price and quality elsewhere. It will often occur that however ably the work may be managed in other respects, the loss through these causes will exceed the profit a contractor would be able to make upon the work.

The item of accidents and damages is one that must be taken into consideration in municipal work. There is a class of people who are conscienceless in the matter of defrauding government. They will trump up claims against the municipality that they would not think of attempting to collect from a contractor, and the average jury is more liberal in awarding damages against municipal or other corporations than against private persons.

The fact is not overlooked that public work by the direct system has usually been undertaken as a temporary measure, under some special conditions which seemed, at the time, to make it necessary. It is not to be doubted that if a municipal corporation should deliberately determine to do all its work, or at least all work of one particular class, as for instance the construction of sewers, by the direct system, and should equip itself with the best appliances for the purpose, and should place the management in the hands of specialists whose whole time and attention would be given to it, better results could be reached than have been common where isolated pieces of work have been carried out under the management of city officials whose other duties occupied most of their time. But even then some of the adverse conditions referred to above would not be avoided. It would seem therefore to be a reasonable conclusion, when all the facts are taken into consideration, that municipal public work cannot be

carried out by the direct system more economically than by the contract system. Perhaps the strongest and most convincing evidence of the truth of this conclusion is found in the fact that in a large majority of the cases where the direct system has been tried it has sooner or later been abandoned for economical reasons, and the contract system resumed. There are, however, not a few exceptions to the rule, notably in the operation of water works and lighting plants, but in these cases success has probably been due to the fact that the work has been done by a specially organized department under the direct management of a skilled head, whose whole time has been devoted to it. These special cases seem to point out the only way in which work can be successfully conducted by the direct system. If for any reason it is deemed best that public work shall be carried on directly by the municipality, special and systematic arrangement for its management should be made. No regular official burdened with other duties should be expected or required to assume direct control and management of such special work. It being hardly possible that isolated pieces of any kind of work can be economically done under the direct system, it would seem advisable, if the corporation is to embark in the business at all, that it should undertake all the work of some one kind, and make deliberate and systematic preparation therefor. A suitable equipment of plant should be procured, and a competent and experienced superintendent should be employed, who should be required to organize the work and to nominate his assistants, and he should then be held responsible for the conduct of his employees and for the proper and economical management

of the work. In these respects he should be regarded as taking the place of the contractor, and should be held to as strict a compliance with plans, specifications, and general instructions as a contractor would be. This would make it necessary to place inspectors over the work, and the same careful supervision should be exercised by the City Engineer's department as if the work were being done by contract. Under such a system responsibility would be undivided, and the best results should be secured, both as to the quality of the work and the economy attained. In no other way, it is believed, can municipal corporations hope to carry out improvements by the direct system with satisfactory results.

CHAPTER V

ADVERTISING, OPENING BIDS, AND AWARDING CONTRACTS

ALL the necessary preliminary preparations for the construction of a public work having been completed, the next step — assuming that the work is to be done by contract — will be to ask for proposals from contractors. Proposals are usually invited by advertising to that effect in the newspapers and technical periodicals. The proper preparation of these advertisements is not so simple a matter as might, at first thought, be supposed. Such advertisements may be divided into two general classes. Brevity is the chief characteristic of the one, which merely states that proposals for a certain work will be received up to a stated date and hour, and that plans and specifications may be seen, and bidding blanks and necessary information obtained at a given address. The other class gives in more or less detail the general character of the work to be done, the approximate quantities of the more important items, the time within which the work must be completed, and the amount and character of the bond required. The additional cost of the longer advertisement is usually small, and it is always to be preferred if wide competition is desired. The fuller information enables the non-resident contractor to judge of the character and

magnitude of the work involved, and the time and capital it will require; and it will often attract bidders from a distance who, in the absence of such information, would not go to the trouble and expense of visiting the locality to obtain it. Ample time should be allowed between the date of publication of the advertisement and that upon which bids are to be opened, to enable prospective bidders to visit and examine the locality and the work, collect the data necessary to figure costs intelligently and deliberately, and to make such preliminary arrangements for capital and plant as prudence may dictate. It is a great mistake, particularly when work of considerable magnitude and complexity is involved, to allow contractors insufficient time to prepare their proposals. If they are compelled to make up and submit bids upon insufficient data and without mature consideration, the more prudent on the one hand will naturally aim to name prices with a wide margin for safety, while the more reckless may, upon the spur of the moment, submit figures so low that they will not be able to carry out the work if it is awarded to them. In either case the corporation is likely to be the loser to a greater or less extent.

The time necessary will, of course, depend upon the character and magnitude of the work and other conditions, and the engineer in charge will be able to determine the proper allowance, provided he be not unduly pressed to shorten the period by impatient city officials.

For the benefit of prospective bidders and the protection of the corporation, the conditions under which proposals will be received, considered, and acted upon should

be made public. These are usually printed at the head of the blank bidding sheet prepared for the use of bidders. The usual conditions imposed are familiar to the public, and need not be detailed here. Proposals submitted which do not conform to these conditions are said to be informal; and it is customary, particularly in the larger cities, to reject them. They should always be rejected unless, as is sometimes the case, the right is reserved in the published conditions to waive informalities. Even where this is done it is generally unwise to admit informal bids to competition. The object of these conditions and of the printed forms of proposals, is that all bids presented may be in the same form and upon the same basis, so that they may be intelligently compared. This may be quite impossible if some of them are informal. Furthermore, the admission of informal or incomplete proposals may be, and usually is, unfair and unjust to other bidders, and, whether justly or not, may expose the city officials to charges of unfairness, or worse, by those other bidders and the public. Thus, if the time for completion named in the conditions is one year, and if one of the bidders demands, instead, thirteen months; or if one bid stipulates that certain requirements of the specifications shall be modified or that the terms of payment be changed, his proposal cannot be fairly compared with the others who bid strictly in accordance with the prescribed terms. It would be manifestly unfair to the others to admit the informal bid, since these others, if allowed to make the same modification, might be able to name lower prices. It may

often seem a hardship to reject proposals because of unimportant, and perhaps unintentional, irregularities; but if informalities are admitted at all, it may be difficult or impossible to draw the line between those that are important and those that are not, or to convince bidders of the importance of one, and the unimportance of another informality. It is, therefore, best strictly to enforce the published conditions, and rigidly to reject all proposals that are informal.

It is usual and proper to require that the bidder shall submit with his proposal a guaranty that if the contract shall be awarded to him he will accept it and will enter into the formal agreement within a specified time. This guaranty may be a bond with sufficient sureties, or what is preferable, a sum of money, or a certified check. The amount of this guaranty should not be excessive. It may reasonably be made sufficient to reimburse the municipality for any direct losses that the bidder's failure or refusal to enter into contract may entail upon it, such as the expenses of re-advertising and making a new award. It may possibly be made sufficiently large to cover any difference between the aggregate sum of the defaulting bidder's proposal and that at which the work may have to be awarded upon re-advertising, but the wisdom of attempting to do this is questionable, and it may be illegal unless coupled with the condition that the defaulting bidder shall be credited with amounts saved in case the re-letting results in a contract more favorable to the corporation. The amount should never be fixed with the view of having it cover punitive damages.

It is prudent and not unreasonable to require that the

guaranties of all the bidders shall be held until the award is made and a contract entered into, but not longer. That of the successful bidder as well as of the others should be surrendered when the contract is finally executed. The practice, occasionally followed, of stipulating that the guaranty of the successful bidder shall be held until some subsequent time, as, in some instances, until the completion of the work, is unreasonable and unwarranted. The contract itself is supposed to provide amply against its forfeiture, and the retaining of the bidder's guaranty may prove very unjust. Thus, the state of New York, when contracting for the improvement of the Erie Canal a few years ago, stipulated that bidders should submit with their proposals a large cash guaranty, which in the case of the one to whom a contract might be awarded was to be held until the completion of, and the final settlement for the work. The state itself forfeited a large number of these contracts, and held the bidding guaranties of the contractors for years until settlement was effected, refusing to pay more than two per cent interest upon the large sums thus withheld from the unfortunate contractors.

The condition reserving the right to reject any or all bids should always be present, even where the laws seem to require that the work shall be awarded to the lowest bidder; and whenever it is at all possible, the right to select the most advantageous bid, whether lowest or not, should be fully and fearlessly exercised. The failure wisely and intelligently to exercise this privilege, whether such failure is due to legal prohibition or to fear of adverse criticism, is the principal cause of the present

demoralized condition of the business of contracting for public work. If city officials were left free to exercise, and did exercise, their best business judgment in awarding contracts, in the same manner and to the same extent as do private persons and business corporations, the wide difference that now exists between the standard of contractors upon municipal public work and that of contractors upon the work of private persons or corporations would largely disappear, and the effect would soon be apparent, both in the quality of work secured and its lower ultimate cost. This subject will be further discussed in another chapter.

No proposals for public work should be admitted after the time named has expired, and those received should be opened immediately after the expiration of that time. Unless this be done, suspicious bidders may have opportunity, if not cause, to charge that the delay is for improper purposes. For the same reason bids should always be opened and read aloud in public, and recorded in a book kept for the purpose, by an official clerk. Proposals when received should be considered and acted upon without unnecessary delay. If for no other reason, this is due to those who have submitted them, since, until the award is made, they may not be able safely to make other engagements. Where, as is the case in too many places, the contract must be let to the lowest bidder or all bids must be rejected, the making of the award is comparatively simple, and too often the principal question to be considered and decided is whether it is better to award the work to an unfit, or questionable contractor, with the certainty of trouble ahead, or to reject all

bids and incur the expense and loss of time consequent upon readvertisement, with the prospect of being confronted by the same conditions when the second lot of proposals are opened.

Where, however, the law permits the persons charged with making the award to exercise their discretion and judgment in choosing from the bids submitted the one that in their opinion it will be for the best interests of the corporation to accept, they should perform their duty without regard to the clamor of the public or the complaints of disappointed bidders. There is every reason why they should, and no valid or sufficient reason why they should not, exercise the same discrimination and judgment in conducting the business of the corporation as the prudent business man does in his private business. Until municipal officials are not only left free to do this, but are held responsible for doing it, and for the way in which they do it, we can hope for little in the way of reform in municipal contracting.

Aside from the expense and delay that readvertisement for proposals must involve, there are objections to it which may be worth considering. It does not always occur that better or lower prices are named in the second lot of bids than in the first. When the first lot of proposals have been opened and the prices named made public, the better class of contractors object, and not without reason, to a readvertisement, since their figures being known to their competitors, the latter, particularly if they belong to the unscrupulous class, can so frame their second bids as to secure the work, regardless of suitable prices, being willing to take their chances of

making a profit by devious methods. Not infrequently the more desirable contractors will decline to submit a second bid under such circumstances. And while the readvertisement may call out lower prices, it may be very doubtful whether, in the end, any real economy will result.

It is important that advertisements, conditions of bidding, bidding sheets and all documents connected therewith shall be so clear and definite that no opportunity for misinterpretation or misunderstanding can occur. These documents usually become, later, parts of the contract, and they should be prepared with the same scrupulous care as the agreement itself. Furthermore, where these papers are vague or incomplete, they may not be clearly apprehended by bidders and informal proposals may result.

Above all, every act connected with the advertisement, the receiving of proposals, and the award of contracts should be of such a character as to leave no room for charges of injustice or unfairness by disappointed bidders or their friends. Officials cannot hope always to escape such charges, but they may by clear and explicit conditions and the greatest possible publicity in dealing with proposals received, place themselves in a position effectually to refute them.

CHAPTER VI

THE CONTRACT

If public work is to be done under the contract system, the proper preparation of the contract becomes a matter of much importance. Strictly speaking, the contract is the document which records the agreement between the corporation and the contractor, but since the plans and specifications for the work embraced in the agreement, the proposal upon which it is based, and the bond to secure compliance with the agreement are usually referred to in, and specifically made a part of, the contract, all these parts are usually spoken of as together forming "the contract." The object of the contract is to record, as definitely and fully as may be necessary, the understanding between the municipality and the contractor. If the language of the contract be obscure or indefinite, or if it fail to cover all essential details, or if one part of it, as the plans, conflict with another part of it, as the specifications, misunderstandings and disagreements are liable to arise between the municipality and the contractor which may give much trouble and may greatly delay the progress and completion of the work and complicate the settlement therefor.

The preparation of the plans and specifications belong among the duties of the engineer; the drawing of the contract and bond, among those of the legal adviser of

the corporation, the members of the legislative branch of a city not usually being expected to assist in their preparation. It is not within the province of this book to instruct the engineer and the city attorney, but, without encroaching on their professional domain, the non-professional city official, or citizen, may consider the broad principles that underlie the law of contracts, and may often be of material service in preparing or intelligently criticising contracts in which they may be interested.[1] Indeed, barring certain formal requirements, the intelligent layman may be quite as competent to frame or discuss an agreement as his lawyer. To say this is not to disparage the special ability or skill of the professional man, or to intimate that his services are not always necessary. The idea is, however, quite prevalent not only that agreements and specifications can be prepared only by the lawyer and the engineer, but that the layman should accept what is offered to him without criticism, and that it is not even necessary or important that he should read, much less comment upon, the documents prepared by the professional man. This is a wrong view to take of the matter. Every business man and every city official should carefully read and study all documents relating to his private or official business, or relating to public business in which he is interested or for the outcome of which he may be more or less responsible.

The important mental qualifications for preparing a

[1] Those who desire to go more deeply into the subject of the law of contracts will find a very satisfactory and quite brief treatment of the subject in Professor J. B. Johnson's work on "Engineering Contracts and Specifications."

business contract are, first, a full knowledge of the facts and details involved and of the terms and conditions to be embraced in the document, and second, the ability to put in writing those facts, terms, and conditions in language whose meaning shall not only be clear and exact, but shall be so precise as to exclude any conception other than the one intended to be conveyed. Ability of this kind is not confined to the ranks of the legal or the engineering or any other profession, and the plain, plodding business man may possess it in a very high degree.

A clause or a provision in a document may appear entirely definite and satisfactory to the one who writes it, but to another it may convey or admit of quite a different meaning from that intended by the writer. Such ambiguity is not uncommon in contracts of the most important character, and often leads to serious disagreements and unfortunate results. It may often be discovered by the intelligent layman, who is likely to approach the subject from a point of view different from that of the professional man.

A contract for municipal work may be defined as an agreement entered into between the municipality on the one hand and a person, or firm, or another corporation, called the contractor, on the other hand, to do certain things, each on its part, for their mutual benefit. Since contracts can be entered into only by the authorized agents of the corporation, acting in conformity with the provisions of laws or ordinances, the first question to be considered always is, has the corporation or its agents lawful authority to make the improvement contemplated, and to enter into contract for the performance of the

work. This is a matter to be determined by the legal adviser of the municipality, but it should be answered in the affirmative before any steps are taken to enter into contract, and reference should be made in the contract, when prepared, to the particular laws, or parts of laws, from which the authority to act is derived. All the steps leading up to the final execution of the contract must be in exact, or at least in substantial accordance with the laws of the state and the ordinances of the municipality, relating thereto. Unless these preliminary conditions are carefully complied with, the contract may be illegal and void, and the municipality, or the contractor, or both, may find themselves involved in serious litigation which may not only prove disastrous financially, but may greatly delay the progress and completion of the work. The contract should set out clearly and explicitly what is to be done by each of the parties thereto. Every condition and contingency that is likely to arise during the progress of the work should be, as far as possible, foreseen and provided for. Details and repetition should not be avoided when they are necessary to make the meaning clear. Brevity may be the soul of wit, but it is not a cardinal virtue in contracts.

Remembering that the contract usually embraces, as a part of it, the plans and specifications for the work to be done, great care should be taken to have these agree with each other and with the terms of the agreement itself. The necessity for this is obvious, but not infrequently discrepancies are allowed to occur through the lack of sufficient care, particularly where changes or modifications have been made in the plans or the specifications during

the final development of the project. It is usual to state in the agreement that where such discrepancies may be discovered during the progress of the work, one or the other of the three parts which constitute the contract shall govern; or to stipulate that the engineer shall designate which shall be followed. But even where such a provision exists, there is often room for serious disagreements between the municipality and the contractor, and not infrequently the contractor may either escape important requirements or may be thus required to incur expense that he had no reason to anticipate, and may seek to avoid by litigation.

In the execution and confirmation of the contract (where the final approval of municipal officers or bodies is necessary), every step should be in accordance with the procedure required by the statutes and ordinances. This applies to the execution of the bonds as well as to the contract itself. The details of compliance with these conditions must be left, of course, to the legal adviser of the corporation.

Outside of the purely legal aspect of such agreements, there are a number of principles relating to contracts in general that are worthy of careful consideration. Before the law, the two parties to an agreement are equal, and entitled to equal consideration. One party may be a great municipal corporation, as for instance, Greater New York, while the other may be an obscure contractor of small means. It is not only equally the duty of each to carry out fully and in good faith the terms and stipulations of the contract between them, but the one is entitled to the same consideration as the other. As a corollary to

this it follows that contracts should be so drawn as to be equally fair and just to both the parties thereto. No one will probably deny the truth of this assertion in the abstract. But in practice it is far too common to ignore the principle, and to attempt to secure to one party advantages that are denied to the other, or to place one party practically in the power of the other. This is usually done under the pretext, on the part of the municipality, that its interests must be protected in every practicable way from any possibility of miscarriage or loss in dealing with the contractor. Contracts for public work are often thus notoriously one-sided, and attempt to place the contractor entirely in the power of the municipality. Take up almost any such contract and every page bristles with clauses intended to secure to the municipality rights that are denied the contractor. Fortunately, the courts usually take a just view of such provisions, and construe unfair clauses very strictly against the party in whose favor they are drawn, or they may set aside contracts that are notably one-sided and unfair to one of the parties thereto, so that if litigation is resorted to, these unfair contracts fail of their object. This being so, it would seem advisable, on grounds of expediency alone, to avoid drawing contracts in such a way as to attempt to secure undue advantage or power to either of the parties entering into them. The courts may be safely intrusted with the duty of settling such questions of difference as may and occasionally will arise between the municipality and the contractor. It is particularly unwise, because usually illegal, to attempt to constitute either party or its agents judges to decide questions of difference that may arise.

It is better to provide that such differences as cannot be mutually adjusted shall be submitted to arbitration, or allow them to be settled by the courts.

In this connection may be mentioned the quite common practice of stipulating that the engineer of the municipality shall be the final referee in all disputes that may arise under the contract. This is done upon the assumption that the engineer is a disinterested person, and therefore competent to perform the functions of a judge and decide justly and equitably such questions of difference. But the facts hardly warrant such an assumption. The engineer is the paid agent and representative of the municipality, employed, among other things, for the express purpose of guarding and defending its rights and interests, and he would be recreant to his duty if he failed to do so. It is natural when questions arise between the municipality and the contractor, where the facts and arguments are so evenly balanced that an unprejudiced and legally trained judge might find it not easy to decide, that the engineer should, unconsciously, lean to the side of his employer. Not only so, but his personal interests and professional reputation may be involved to an extent that may unconsciously warp his judgment. Under such conditions, to render an unprejudiced and judicial decision would require qualities of mind that are more than human. The fact that provisions making the engineer a referee in case of differences are of such frequent occurrence in contracts for public work, and that such provisions are not usually objected to by the contractor, must be regarded as strong evidence of the high character of the members of the profession and their reputation for

dealing fairly and justly, and it can be said without fear of contradiction that, as a rule, the confidence thus reposed in the engineer is fully justified by the results. It may be safely asserted, however, that the conscientious engineer will shrink from assuming such a responsibility, and would be glad to see the practice of attempting to make him both advocate and judge abolished.

There is, however, a class of questions which the engineer in charge of the work may with propriety be called upon, and may properly assume to decide; such, for instance, as the measurement of quantities, and other questions of fact. Another class of questions, such as the reasonable interpretation of the specifications from a technical point of view, and matters of equity arising under them, undoubtedly require for their proper adjustment the technical knowledge and trained judgment of an engineer, rather than the legal acumen of the judge, and this fact suggests the expedient of naming in the contract, as referee, some disinterested engineer in whom both parties have confidence, to whom differences of this character may be submitted and whose decision shall be binding on both parties, so far as the law permits.

It must not be overlooked, however, that decisions of arbitrators are not infrequently set aside by the courts, even where both parties have formally agreed to accept their decision as final, and care must therefore be exercised to restrict the matters referred to them to such as the courts have considered as coming within the limits of their legal adjudication. It seems not very easy to define intelligibly for the general reader just what powers may be legally delegated to arbitrators or referees for final decision, but

it may be broadly stated that questions of measurement and the estimation of quantities, the classification of materials, and the quality of the work done, may be safely thus delegated. The courts will usually sustain the decisions of the engineer in charge, where he has been made final referee, in all cases where he is, from the nature of the case, more capable than the courts of arriving at and judging of the facts, provided it cannot be shown that he has made gross errors, or that he has acted from improper or fraudulent motives in arriving at his decision. But in cases where the courts are obviously as competent as the referee to pass upon the facts, and in all cases of law or equity, they will be likely to set aside his decision and reopen the case. The courts seem to regard with great suspicion any attempt of a party to "sign away his rights" under the law, and are disposed to regard such action as null and void.

The purpose of the bond attached to the contract is to insure compliance, on the part of the contractor, with the terms of the agreement and to secure the corporation against any contingent loss occasioned by his failure to carry on and complete the work. Its function is therefore a very important one, and as its value depends entirely on the responsibility of the sureties, it is obvious that the greatest care should be exercised in scrutinizing such sureties. As a rule, great carelessness prevails in this important matter. The records of almost any city will show that in very few cases indeed, where a contract is forfeited, does the corporation succeed in collecting anything from the sureties. It is true that not all the failures to recover are due to the irresponsibility of the sureties,

but this is the fact in the great majority of cases. State and municipal laws are generally very strict in regard to the acceptance of sureties, but their spirit, if not their letter, is very generally violated. It is not sufficient that a surety shall make oath that he has unencumbered property of the required value; his financial standing and his business reputation should be looked into with the same care that a merchant would exercise before extending him credit to the extent of the liability upon the bond. A number of responsible surety companies now undertake to underwrite contractors' bonds, and surety of this character is greatly to be preferred and should always be required by municipal corporations. Contractors may object to furnishing surety of this kind upon the ground of its greater cost, alleging that they can secure the signature of friends without expense to them. As a rule, those contractors who are unable or unwilling to offer such surety may safely be regarded as untrustworthy.

CHAPTER VII

THE CONTRACTOR

THE municipal contractor does not as a rule enjoy a very enviable reputation in the community. He is looked upon with more or less suspicion by the large majority of citizens and taxpayers. It is not openly charged that he belongs to what are known as "the criminal classes," but in the minds of many worthy people the line that differentiates him from those classes is not at all well defined. He may not be a pickpocket, nor a burglar, nor a gold-brick man, but that he will steal and defraud under the guise of prosecuting his business is more than suspected by many good people. He may not be a gambler in the common acceptance of the term, but many people have an idea, strengthened, perhaps, by the diamonds he sometimes wears and occasionally by his "sporty" appearance, that he in some manner toys with fickle fortune. It is true that he is not often directly charged with murder, but there are not a few people who, if such a charge were made, would promptly exclaim, "I told you so!" He is believed to be ready to resort to improper and corrupt means to obtain contracts, and when they are obtained, he is supposed to devote his best ability, not to the execution of the work in accordance with the specifications, but rather to devising schemes whereby he may evade their requirements. To attain this end he is supposed to be

ever ready to deceive, bribe, or intimidate inspectors and city officials, and to resort to any disreputable means that may be necessary. He is supposed to have great political influence which he uses to accomplish his nefarious purposes. In fact, his "pull" is supposed to be a part of his business outfit, just as much as are his mules and his carts.

Yet, when we think of it, there is nothing in the nature of the business of undertaking to do public work by contract that is essentially wrong, or that need smirch the reputation of any man. The business of the merchant or the manufacturer or the banker who supplies the needs of the public in other ways is not, in its nature, a whit more or less honorable than that of the contractor. This will hardly be denied by his most bitter traducers. It will hardly be claimed by the most virulent that, considered simply as a vocation, there is anything in contracting that should specially attract criminals, or that should demoralize and corrupt the honest and respectable man who engages in it.

It would be unreasonable to suppose, however, that there is not some substantial ground for the unfavorable opinion that undoubtedly exists in the mind of the public regarding contractors for public work, as a class. I say as a class, because there are many notable exceptions to the rule. There are men who have, almost all their lives, followed the business of contracting on public work, than whom none enjoy to a larger degree the confidence and trust of the public; which seems to prove that it is possible to be a contractor and at the same time an honest and reputable man.

Such being the case, and considering the importance and magnitude of the municipal work that is done, and is likely to continue to be done under the contract system, it is desirable that the whole subject of contracting and contractors should be carefully reviewed. The student of municipal affairs will naturally inquire why the business of municipal contracting has become so demoralized, and will endeavor to find a rational explanation. There must be some cause. Is that cause traceable to the contractor alone, or is it to be found partly, at least, in the conduct of others, and in the system under which contracts are let and carried out?

A little study will show that the situation is not nearly so bad as is represented, or as the public believes. Many cases will be found where contractors follow in their business the same reputable methods observed by other good business men in the community. These, however, do not attract much public attention. It is the disreputable contractor who is most in the public eye, and who occasions a large measure of the notoriety that moulds public opinion regarding the business in general.

One of the earliest observations of the student will be that there is a marked difference in the character and standing of that class of contractors engaged in strictly public work, and especially in municipal public work, where contracts are necessarily let to the lowest bidder, and that class whose business is more particularly private contracting, where competition is not so promiscuous, and where the work is not necessarily awarded to the lowest bidder. It will be observed that many persons and corporations, among the latter the more important railroad

systems, privately ask proposals from a limited number of contractors of known character and responsibility, and in awarding contracts take into consideration the financial ability of the bidders, their equipment for the particular work to be done, their reputation for carrying out their engagements, and so forth, as well as the prices they offer. It will be found that contracts so awarded are generally carried out satisfactorily, and are comparatively free from the friction, vexation, and scandal that too generally accompany ordinary municipal contracts. It must be presumed that the corporations following this method of letting their contracts, find it profitable, — otherwise they would not adhere to it. Further study will establish the fact that, as a rule, contractors engaged in this class of work are men of at least average intelligence, business capacity, and integrity, as judged by common business standards. Not a few of them are men, or companies composed of men, of undoubted financial responsibility, of a very high order of business capacity, and of sterling honesty and honor, who compare favorably with the best in other lines of business, and are highly esteemed in the communities where they reside. They seem to belong to a different class entirely from the average municipal contractor. This cannot well be a mere coincidence. It indicates that there may be something in the method of letting or of conducting municipal contracts that is responsible for their frequent unsatisfactory character, and for the development of a low class of contractors.

Let us look into the matter further. Men, or associations of men, engage in the business of contracting for profit, just as other men engage in other lines of business.

Unlike some other businesses, that of the contractor involves a considerable factor of chance and uncertainty. It is impossible for any one, whatever may be his knowledge of the obtainable details of any public work, or his experience in conducting similiar work, to estimate very accurately what the work will cost. There are always elements of uncertainty that make it necessary for the prudent contractor to provide a safe margin in the prices he proposes, to cover possible contingencies. These contingencies are the unknown quantity which enters into every proposal of the contractor, and the values placed upon it by different contractors may vary widely.

Assuming that the contractor is well informed in regard to the cost of similar work, he is liable, in the face of sharp competition, to trench unduly on a safe margin for unknown elements, and to make his prices so low that they will not afford a reasonable profit, and may even involve a loss.

Now, municipal contractors may be roughly divided into three general classes. To the first belongs the contractor who conducts his business upon a legitimate and honest basis and in accordance with the principles that govern other sound business enterprises. If successful in securing a contract, he will expect to prosecute and complete the work in accordance with the requirements of the contract and specifications. He assumes, as he must, that these requirements were made to be complied with, and that they will be enforced. Being a man of financial responsibility and business integrity, he cannot afford to offer prices that do not promise, in his judgment, not only to cover the cost of the work, but to offer a fair

assurance of reasonable profit. To the second class belongs that numerous group of contractors who are without financial responsibility or established character, and often without experience in work of the character they bid upon. They are "soldiers of fortune," to whom contracting is little more than a species of lottery. They have neither capital nor character that can be lost or impaired. They stand to win only in the lottery; since they have nothing that can be lost. If losses occur they do not worry, since somebody else must bear them. They frame their proposals with the object of being safely below competitors, trusting, if they secure the contract, to their wits or to the tricks of the trade to get something out of the deal. They are, naturally, not scrupulous about the means they employ to gain their ends.

To the third class belong those contractors who rely on corrupt methods for their success. To this class belongs the "boodler," with all his devious ways. To him the character and market price — if he have one — of every city official is known. He knows which of them are open to "influence," with all that the word implies. When a contract is to be let, he plans his campaign to secure it with a skill and diplomacy worthy of a better cause. When his arrangements are satisfactorily perfected he will not hesitate to bid, if necessary, below the cost of doing the work, relying, with reasonable assurance, on his official friends for protection and profit.

When proposals are opened for doing any public work, the contractors of the first and second class are quite sure to be represented, and the third may be if conditions are favorable to his methods; and the agents of the corpora-

tion, whose duty it is, are called upon to consider the proposals offered, and to award the contract. At this point will be found, it is confidently believed, the source of the conditions which have brought the municipal contractor into disrepute.

It must be assumed that the agents of the corporation, charged with awarding contracts, are actuated alone by a desire to promote the best interests of the public, and that consequently they will be disposed to make the award in accordance with facts and upon sound business principles, just as would a private person or corporation in transacting his or its own business. But they at once find themselves hampered by laws or fixed customs, to which they must conform, whatever may be their better judgment. In many states and cities the law is explicit that contracts must be awarded to the lowest responsible bidder or that all bids must be rejected, and the courts have quite generally ruled that a bidder is responsible who is able to offer a satisfactory bond for compliance with the contract.

This nearly always means that the contract must be awarded to the lowest bidder, since almost anybody can, under the present lax practice, obtain sureties upon his bond. The city authorities have therefore no choice in the matter but to award the contract to the lowest bidder, since to reject all bids and readvertise will simply result in delay, as there is no way to shut out the same objectionable bidders, or others of the same class, who will be on hand when the second proposals are submitted, and they will be confronted with the same conditions as before. This would be true no matter how many times the bids were all rejected and the work readvertised. Conse-

quently they may as well act upon the first lot of proposals offered and take the consequences. We will suppose the simplest situation that may be presented to them. It is found that proposals are received from A and B. A's bid is much the lower of the two. It is, in fact, so low that every intelligent person with any knowledge of the character of the work knows very well that it cannot be honestly done at the prices named without serious loss. Furthermore, it is well known that A has a very bad reputation as a contractor. He is irresponsible financially and otherwise. He has never been known to carry out a contract honestly or in a businesslike manner; on the contrary, it is well known that he will cheat and defraud at every opportunity, and that he relies upon crooked methods to get out whole or to make a profit on his contracts. The city is confronted with the probability, almost the certainty, that if he be given the contract the work will not be completed by him, or if completed at all, it will be only after long delays and endless trouble. On the other hand, B is known to have ample means to carry on the work; he has an established reputation for performing in good faith and in a businesslike way any contracts he may undertake, and his integrity is unquestioned. The prices he names, while higher than those of A, seem to be not unreasonable,—apparently only sufficient to cover the cost of the work and afford a moderate profit. If the body of men who must make the award—say a board of public works, the members of which are good business men—had to meet the same question in their private business, not one of them would hesitate a moment in giving B the work; and they would do the same in the

public business if the law and misguided public opinion allowed them to exercise their judgment. But it does not, and if A can give a satisfactory bond, they have no choice but to award the contract to him. They may, and doubtless do, know that the bond does not, in fact, safeguard the city, because bonds, for various reasons, are usually not collectible, or in any event that they are seldom enforced. But the law does not take cognizance of that practical fact, and the board is helpless, and A gets the contract. The consequences are too well known to every city official and to nearly every citizen to need recital here. As succeeding contracts are let, the operation is repeated, and A and his class of contractors practically have a monopoly of the business. B and the class of contractors to which he belongs have not a ghost of a chance to secure work, and they are soon driven from the field. The cause of the unsavory reputation of contractors on municipal work is thus readily explained.

So far we have not considered the chances of C who belongs to the third class named above, — the boodler. He is not always absent when contracts are to be let. Now C, barring his "boodling," may be a very respectable contractor. He may have and usually does have means, may be energetic and capable in handling his contracts, may pay his just as well as his unjust debts, and may deal honorably with the public at large. He may in fact have originally belonged to the first class of contractors, and under more favorable conditions would still prefer to remain in that class. When B finds himself uniformly unsuccessful in securing contracts by fair and open methods, and in danger of being driven out of his

chosen business, he may, if the opportunity offers, degenerate into C. He may reason thus: "I am a contractor by occupation and training, am not acquainted with and may not succeed in another line of business. I depend upon contracting for my living. I must secure contracts or starve. I am barred out by the law from obtaining contracts at living prices by fair and open methods. I am compelled to resort to some other method. If city officials who control the letting of contracts are approachable for a consideration, I must avail myself of their aid. With that aid I can circumvent A and B and get plenty of work and make good profits." If the moral phase of the matter presents itself to him, he reasons thus: "If city officials are disposed to barter their influence for a consideration, I may as well deal with them and secure their influence as any one else; if I do not, some one else will. It is they who do wrong, not I. If they are dishonest and defraud the people, whose servants they are, I am not to blame. If the people elect dishonest men to office, they must take the consequences. It is no concern of mine. If they create a condition of affairs which makes it necessary for me to resort to questionable methods to secure business, I simply accept the situation; they must not hold me responsible." Of course, the argument is fallacious, but it is not without some plausibility, and C does not pretend to be deeply versed in either ethics or logic. It is safe to say, however, that as long as influence is on the market, purchasers will abound, and C obtains, and will, it is feared, continue to obtain, a good many contracts. "But how can he obtain them?" it may be asked. "Must he not meet both A and B in open com-

petition? and if either of these should be the lowest bidder, must not the contract be awarded to him?" Presumably, yes. But C and his acquired friends may find a pretext, possibly arranged beforehand, for declaring him the lowest bidder. There are tricks in proposals as well as in other trades. A carelessly written or misformed figure has been known to read either 3 or 5, as occasion might require. C will usually, however, take care that his bid shall be safely low upon the face of the returns, though it may be really otherwise. It is not always the case that bids which on their face are made to appear lowest prove to be so in the end. The bid, for instance, may be what is known as an "unbalanced" bid.

A case in New York City, some years since, may be mentioned by way of illustration. A contract was let for a large quantity of excavation for a street improvement. The preliminary estimate of quantities indicated that the cut was almost wholly earth, with a very small quantity of rock. The successful bidder, whose proposal, computed on the basis of the estimated quantities, was apparently lowest, named a very low price on earth excavation and an abnormally high price on rock excavation. As the work progressed it developed that the cut was almost wholly solid rock, and the final estimate returned, when the work was completed, was many times the amount of the preliminary estimate, and the profit of the contractor was very large. It was discovered that the city employee by whom the preliminary estimate was made up was a near relative of the successful contractor. It is not likely that the false preliminary estimate was the result of an ordinary mistake, and the inference was justi-

fiable, though the fact could not be proved, that the preliminary estimate was purposely falsified to deceive other contractors, and favor the one who doubtless had "inside information." But even if C finds it necessary to bid lower than A to secure the contract, it does not follow that his contract will prove unprofitable in the end. His friends among the city officials can readily manage such a situation. It may develop that large quantities of "extra work" are found necessary, to be paid for upon "extra bills" at very profitable prices. While the specifications may be very exacting, they may be eased off so as greatly to decrease the cost of the work to a favored contractor, and thus allow a good margin of profit. Again, the specifications may be purposely made vague, so as to admit of different interpretations which would greatly vary the cost of the work. The ordinary contractor who has not arranged for special favors, must, to be safe, bid on the more costly interpretation, while the favored contractor may safely depend on the interpretation that will cost the least money. There are many such ways in which a favored contractor may realize a handsome profit where, apparently, an actual loss stared him in the face.

Even where the law does not specifically require public work to be let to the lowest bidder, custom and public opinion are almost as inexorable, and not many municipal officers are brave enough to ignore the established rule. The public has not sufficient confidence in the officials whom it chooses to transact the public business to trust them to exercise their business judgment in the letting of contracts. The laws referred to, found in the statutes of many states, have their foundation in this fact. Their

avowed object is to prevent fraud, collusion, and favoritism in awarding contracts for public work. Their existence is an implication that officials are not to be trusted. It is hardly necessary to say that they do not serve the purpose intended; on the contrary, it may be confidently asserted that they work, indirectly, against the public good. It may be safely stated that official corruption and fraud have never been, and probably never will be, prevented by legislative enactment. It seems possible to evade or nullify the most iron-clad statute that legislative acumen and skill can frame and enact. If municipal officers are disposed to be dishonest or corrupt in the letting of contracts, and are willing to take their chances of conviction and the punishment which the law provides for these crimes, they will find a way to accomplish their purpose, regardless of statutory prohibition. It would seem that the probability of detection and conviction for these crimes is not so great as to be deterrent. Either this must be true or the very prevalent belief in the dishonesty of city officials generally must be largely unfounded, since prosecutions and convictions for this class of offences are very rare.

It must be evident, then, that the only way in which contractors of the C class can be suppressed is by the election of honest men to the city offices. People seem slow to realize that however carefully the laws may be framed to prevent corruption in the conduct of public work, safety can be found only in selecting officials to conduct such work, in whose integrity they can rely implicitly. It would be a gross slander to say that such men cannot be found in every community, and a severe and

unwarranted imputation on their public spirit and patriotism to assert that they cannot be induced to accept public office under proper conditions and for adequate compensation. Dishonest men can be elected to office only by the sufferance of a considerable part of the better class of citizens, and the communities are rare where the better element is not strong enough, if active and united, to control municipal elections. It may seem harsh to say so, but the municipality that voluntarily places its purse in the hands of suspected thieves is entitled to scant sympathy when its funds are stolen. It is a mistaken policy to place questionable men in the offices and then depend upon laws, however stringent, to restrain them from wrong-doing. On the other hand, if only men of unquestioned integrity and sound business judgment are placed in office, restraining laws are unnecessary.

This hasty survey of the conditions under which municipal contracts are awarded, leads to the conclusion that the prime cause of the present demoralized state of municipal contracting is found in the laws, or, in the absence of such laws, in the public demand that contracts must be awarded to the lowest bidder. It is unnecessary to argue that, in conducting municipal business, city officials should be governed by the same sound business principles that prudence and experience have shown to be wise in the conduct of private business. In the letting of contracts for public work, they should have full power and authority to accept any proposal which, in their opinion, would best serve the interests of the city. In considering the merits of proposals offered, they cannot prudently avoid taking into account the character, responsibility,

and business reputation of a bidder, as well as the price at which he may offer to perform the work. Every prudent man does this in his private business. He places his orders for goods with reputable dealers, whom he can trust to carry out their engagements as to quality, time, and circumstance, and not necessarily with those who quote the lowest prices. If he has a house to build, he awards the contract to one who he believes will carry out the plan and specifications fairly and honestly, even though his prices are higher than some others. If he wants a suit of clothes, he does not buy it at a cheap and disreputable clothing store, or of an unreliable tailor, because their prices are lower, but he goes to those in whose skill and reliability he has confidence. Experience teaches him that in the end he will make money by doing so. This is as true of public as it is of private business. Low prices do not necessarily mean economy in the end; — they often mean exactly the reverse.

If contractors undertake to do work at prices below cost, it is evident that somebody must lose money; — and usually it is not the contractor.

There is another argument against requiring that the lowest bid must be accepted. It is a well-settled principle in governmental administration that responsibility must be undivided, in order that officials may be held to a strict accountability for their acts. If the law ignores this principle by making the award of contracts to the lowest bidder mandatory, it relieves municipal officers to that extent of responsibility for their action. If the law compels the award of a contract to A against the better judgment of the awarding power, the law must

bear the responsibility for the result, whether good or bad. Officials acting under it may claim they are not justly responsible; — they have complied with the law which allows them no exercise of judgment. They may even, if they are in corrupt collusion with contractor C, make use of this mandatory provision as a screen behind which to hide their iniquitous schemes. On the other hand, if public works officials were required to bear the entire responsibility of awarding contracts as well as of prosecuting the work, and were judged, as they might then be, by the results, there can be little doubt that the contractors of A's class would soon find their occupation gone. As for contractors of C's class, they will be with us as long as dishonest men are found in responsible charge of public work. "Where the carrion is, there will the vultures flock together."

If, therefore, it is desired to bring about a reform in the character of contractors on municipal work, the means to be employed must be: —

First, exclude dishonest men from office. Select for the men or bodies of men who are to have charge of the awarding of contracts, and the prosecution of public work, men not only of undoubted integrity, but of trustworthy business ability.

Second, with such men in charge allow them an untrammelled hand to deal with the city's interests, including the awarding of contracts, as they would with their own private business, and

Third, hold them strictly accountable for the results achieved.

There are plenty of people who will hold up their

hands in horror and cry that this means revolution and autocracy. Even so; a revolution is needed. Long experience proves that the present methods of dealing with municipal contract work are most costly and unsatisfactory, and that a radical change is needed. If the foregoing reasoning is fallacious and the conclusion wrong, let the fact be demonstrated, and a better remedy pointed out.

The ideal system of conducting public work being one under which the business would be managed upon the same principles and with the same care that the best class of business men apply to their private business, any measure which promises to bring about this ideal state of affairs is at least worthy of sober consideration.

CHAPTER VIII

THE SUPERVISION OF PUBLIC WORK

THE contract for the construction of any public enterprise having been entered into, it is necessary to exercise careful supervision over the work while it is in progress. Such supervision belongs largely to the department of the City Engineer, and he may be held accountable for most of the results. In a matter of so much importance his responsibility should not be divided, and his power and authority should be largely untramelled. The other officers of the corporation will, however, find that many duties will devolve on them which will require the exercise of their care and vigilance. It is not unusual that conditions will develop, during the progress of the work, which render desirable or necessary the making of changes or modifications in the terms of the original contract. This should in all cases be accomplished by supplementary agreements, which should be prepared and executed with the same care as the original contract. In fact, such supplemental contracts often require more care and vigilance than the originals. For, while their terms may embody the changes desired, it is important that they shall not modify or nullify other parts of the original agreement, which they are not intended to affect. Cases not infrequently occur where supplemental contracts are so carelessly or ambiguously

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drawn as to release the contractor from important obligations imposed by the original contract. A common oversight in making supplemental contracts which modify the terms of the original, is the failure to secure the consent of the sureties on the bond, which consent should always be in writing, and be made a part of the secondary contract. The neglect of this precaution may result in invalidating the original bond.

Within certain stipulated limits, contracts usually provide that the engineer shall have power to vary the details of construction, and when such changes affect, in any material way, the cost of the work, that any necessary modification of prices shall be agreed upon in writing between the contractor and the engineer. This is a very proper and necessary provision, and should in every case be strictly adhered to, and no such agreement should be considered as valid or binding upon either party, nor should any work to which the change may apply be allowed to proceed until the written agreement relating to it is duly signed. Too often, in the press of work, a verbal agreement is reached and the work allowed to proceed, with the intention of reducing the terms to writing later; but this is overlooked or neglected, and in such cases misunderstanding and trouble may result, particularly if the contractor is disposed to take unfair advantage of any oversight on the part of the municipality or its engineer. It is desirable that all important instructions and orders to the contractor should be reduced to writing, and the language of such communications should be exact and clear. They should be very care-

fully prepared, and their possible bearing on every feature of the contract considered. It is advisable that all important communications of this character should be submitted to the legal adviser of the municipality before their delivery to the contractor.

It is, of course, to be assumed that a contractor undertaking to execute any public work has, before signing the contract, made himself familiar with its terms and requirements, including those of the drawings, specifications, and bond, which are a part of it. It must further be assumed that, in entering into such a contract, he intends to comply in all respects with those requirements, and that the municipality will require him to do so. Barring such misunderstandings as are always more or less possible, there should, therefore, be no friction between the contractor and the municipality or its agents during the progress of the work. This, however, is an ideal state of affairs which is not very often realized, some of the reasons for which are considered more in detail in the chapter devoted to the contractor.

The municipality and its agents have every right to insist that the contractor shall comply fully and fairly with every requirement of the contract, and any failure on their part to enforce such compliance is a violation of duty and a breach of trust on their part, for which they should be held strictly to account. The contractor has the undoubted right to expect equally full and fair compliance on the part of the municipality and its agents. The obligations to each other of the parties to the contract cannot differ in that respect. In justice to contractors it may be said that city officials themselves

do not always recognize and act upon this self-evident principle.

One of the most frequent causes of friction between contractor and engineer arises from the desire of the former to substitute other materials or different methods for those stipulated in the contract, the contractor claiming that the materials or methods proposed by him are equally good and will produce results equal in every respect to those called for in the specifications. If his contention be true beyond any question, there would seem at first thought to be no valid reason why the substitution should not be allowed, particularly if it will result in a material saving of cost to the contractor. But the "just as good" claim is trite in all branches of business, and experience leads us to be very cautious about accepting it. The presumption should always be against it, and ample proof should be insisted on. The municipality and its engineer should be the sole judges in matters of this character, and should not yield unless thoroughly satisfied that the substitution asked for will not be detrimental to the work. Even when they are fully satisfied on the ground of utility, there is generally a question of policy that must be taken into consideration. The public, lacking exact information, and too often ready to impute wrong motives to municipal officers, may suspect that the change was allowed purely as a favor to the contractor without proper consideration of the interests of the municipality. And while in matters of right and wrong the engineer must be inflexible, regardless of public clamor, he may properly be very jealous of his good reputation, since his success and his usefulness to the municipality

depend thereon, and he may with perfect propriety hesitate to grant a request which has a money value to the contractor, but which the contractor has no right to ask or expect, except as a favor. When, as is not infrequently the case, changes or substitutions requested by the contractor will result in obvious benefit to the municipality as well as to himself, there can be no valid reason for withholding consent. The general attitude of the engineer should be, and usually is, one of willingness to help the contractor so far as his duty to the municipality and to himself permits, but he must be the sole judge in matters of this character, and the honest and reasonable contractor will not expect him to overstep the line of conduct he may think it right to adopt.

A very recent occurrence in a Southern city illustrates the fact that it is not always prudent or wise for the engineer to vary from the strict letter of specifications, in order to grant an apparently just concession to contractors, even though such concession may result in actual benefit to his employers. In an extensive and important public work, the specifications, prepared several years before the work was constructed, required the use of imported Portland cement, but the standard of quality, or strength, stipulated was comparatively low. In the meantime the manufacture of American cement had developed rapidly, and the contractor, finding that he could purchase domestic cement of a better quality than that required by the specification at a price considerably below what he would have to pay for the imported article, requested the engineer to allow him to use the domestic cement. There being no apparent reason why the request should not

be granted, since the city would be benefited rather than otherwise, the engineer allowed the substitution in certain parts of the work, at the same time raising the requirements of the specifications as to the quality of the cement to be furnished. The fact becoming known, a great outcry was raised by the newspapers and captious citizens, charges were preferred against the engineer, and a public scandal created. The engineer, one of the ablest and best known in his profession, whose character is above suspicion, felt it advisable to resign, though an investigating committee of experts not only exonerated him from all charges of wrong-doing, but approved his action in the matter, as being in the interest of the city. It was not charged, indeed, that there was any intentional wrong-doing or taint of corruption in the transaction, the complaint being that the engineer should not have allowed the change without compelling the contractor to make a reduction in his contract prices equal to the amount he would save by the substitution of the cheaper, though better, cement. The result of this unfortunate controversy has been not only that the engineer has been subjected to a very painful experience, but that the city has been deprived of his very valuable services, the work has been more or less demoralized, and the contractor has doubtless suffered more or less injury.

It being usually impossible for the City Engineer or his immediate assistants to give constant attention to any one piece of work, inspectors are usually appointed whose duty it is to be on the ground whenever the work is in progress. Of the selection and appointment of inspectors, something has already been said in Chapter II. It is an

error to assume that inspectors are necessary only upon the work of dishonest contractors, and it is equally erroneous on the part of the contractor to assume that the appointment of an inspector over his work is necessarily an imputation upon his honesty. However desirous the contractor may be of complying fairly and honestly with his obligations, he cannot, any more than can the City Engineer, be present at all times and supervise all details, and his subordinates may not only be ignorant and careless, but may not be actuated by the same high motives as their principal. There seems to be a settled conviction in the mind of many a foreman and skilled mechanic, that his principal is not always quite sincere, but is talking merely for effect when he gives instructions to do the work honestly; and that he himself is never quite doing his duty or meeting expectations when he is not "getting in" a judicious amount of crooked work, even though his employer is not benefited thereby. He seems to feel that he has a reputation to sustain for clever work of a shady character, and cannot afford to let slip any good opportunity for displaying his smartness and skill. He needs watching, and it is the inspector's duty to detect and prevent such exhibitions of his peculiar ability. As a rule the honest contractor does not object to, but rather welcomes, the presence of inspectors on his work, provided, always, that they are honest, competent, and reasonable.

The question of how much authority shall be delegated to inspectors, and what latitude of judgment they shall be allowed to exercise, is one of some difficulty, and no hard and fast rule can be laid down. Beyond the general instruction that they must enforce the terms of the contract,

the judgment of the engineer must be exercised in each individual case. The inspector's judgment should not, as a rule, be relied upon in the matter of permitting variations from contract requirements.

The importance of keeping accurate and complete records during the progress of public work seems not to be fully appreciated. Facts that may appear unimportant, and even trivial, at the time of their occurrence, may become of great utility in the future, and unless they are recorded in writing at the time, they may wholly escape the memory, or may be recollected so indefinitely as to be of little value as evidence, after the lapse of months or even years. But written records made at the time and on the spot never lose their value. In the litigation that not infrequently grows out of disputes and misunderstandings in final settlement for contract work, the case may be lost or won by the absence or presence of such records. The inspector should carry a memorandum book in which he should note at the time salient facts, and as many as possible of the details of each day's work, making, where practicable, sketches to illustrate the records. The receipt of materials, the character of the weather, the number of hours worked, the number of men and machines employed, and any unusual occurrences, should all be included in the written record. The City Engineer and his assistants should also note and record observations, important conversations, and verbal instructions, and all important facts that may come to their notice. This may be tedious, and may consume time that could seemingly be better employed, but the value of such records in a single disputed or litigated case may be greater than the whole year's

salary of the person making them. A case occurs to the writer's mind where the discovery by a contractor that two different persons connected with the work had complete daily records of what occurred, influenced him to desist from bringing suit for a sum exceeding one hundred thousand dollars. If these employees had trusted to their memory alone, after the lapse of two years, the contractor might have reasonably counted on their evidence being of little value.

During the construction of any public work there are likely to be complaints made by citizens, of slow progress, or charges or insinuations of bad work, or of wrong-doing. When these are made in good faith they deserve and should receive respectful attention. They may and often do come from a class of people whose zeal is due more to their love of notoriety or to an innate disposition to make trouble than to more worthy motives. Unfortunately, it is seldom good policy to treat this particular class of fault-finders with the contempt they deserve. In our American system of government every citizen may be said to be a stockholder in the municipal corporation, and to have vested rights that must be recognized. Other critics will be men of character and standing, actuated by a sincere purpose to serve the best interests of the city. Between these two extremes all gradations of self-constituted inspectors will be found, and all manner of complaints and charges, from the frivolous and absurd on the one hand, to the serious and important on the other, must be listened to and considered. To deal with them all requires a large stock of patience, good sense, and diplomacy, which might often be better employed.

Complaints must be investigated more or less as their importance may deserve, explanations given, misinformation corrected, and, when necessary, remedies applied.

When a contract is completed, the work is to be finally inspected and accepted. The final inspection is for the purpose of ascertaining if everything has been done that is called for in the contract, and to discover any injuries, accidental or otherwise, that may have occurred to the work during its progress, and which it may be the duty of the contractor to repair. The contractor will naturally be anxious to have the work accepted with as little delay as possible, so that his final estimate may be passed, and he is entitled to reasonable expedition on the part of the engineer, but ample time should be taken to make the inspection deliberately and carefully.

CHAPTER IX

THE MAINTENANCE AND REPAIR OF PUBLIC WORK

THE idea seems to be somewhat prevalent among citizens and municipal officials alike, that when the construction of a public work is completed, it should remain in perfect condition indefinitely, and that all thought of provision for its care and maintenance may be dismissed from the mind. When some unexpected defect develops, it is noted with a feeling of shock and suspicion, and it is at once inferred that some one has failed in his duty and that the city has been defrauded. Those who so think fail to consider that, however carefully a structure may be designed and built, whether it be a house, a ship, a water-supply system, or a bridge, defects both of design and construction are almost sure to develop that escaped notice while the work was in progress. The best and ablest of men are fallible, and their work is seldom perfect, even when they do their best. It will therefore usually occur that from the moment a public work is accepted from the hands of the contractor, and long before the effects of wear and tear begin to appear, expenditures for maintenance must be provided for.

Assuming that proper care and diligence were exercised in the design and construction of the work, the amount of such expenditures, during the earlier life of the work, should be small, but such defects as do appear should be

remedied promptly. It is therefore important that suitable provisions for the maintenance of public work shall be promptly made when its construction is completed. That "a stitch in time saves nine" is as true of the repair of municipal public works as it is of clothes, and that the neglect of the precept often results in greatly increasing the cost of repairs, to say nothing of possible contingent loss and inconvenience, is amply proved by experience. Good business men understand and deal with this matter more rationally and intelligently than the average municipal corporation. When the mill owner installs a newly designed machine he does not expect that at first trial it will be found to work perfectly. While in the main it may meet his expectations, he will not be surprised if some imperfections are found, and if found, he will set about remedying them at once. Later, when parts of the machine begin to wear out, or breaks occur, he will have the necessary repairs made promptly. He knows that it is profitable to keep his machinery in perfect working order. Those who are intrusted with the care of municipal public works should follow the same policy.

Perhaps no class of public work requires such close and constant attention as the streets and pavements of a city. In addition to defects of construction, and the wear and tear of use, their surfaces are being constantly disturbed for the construction or repair of underground structures. Even after every reasonable effort has been made to have all new water and sewer connections and other underground work put in before the work of paving has been begun, it will generally occur that within a very short time after a new pavement is completed urgent demands to open

it will be made, and the circumstances will be often such that the demand must be acceded to. Deplorable as it may appear to have new pavements, constructed at great cost, torn up almost as soon as they are thrown open to travel, we may as well admit that it cannot be avoided, and content ourselves with careful provision for their restoration as promptly and as perfectly as possible. It is difficult to restore some varieties of pavement to their original good condition, and it is not an easy thing to do in the case of those whose restoration is most practicable. The work should be done only by skilled labor, and should not be attempted, as is often the case, by the common labor available on the work at the time. Competent inspectors are more necessary on such repair work than on the original construction, and they should always be provided.

Street traction companies are usually the worst offenders in the destruction of pavements, but they are not always without valid excuse. In this day of rapid advancement in traction methods, changes and improvements follow each other quickly, and it is usually as much to the interest of the public as to that of the traction companies themselves that no obstruction shall be offered to the adoption of such improved construction as will make better service possible.

The records of most cities indicate that the maintenance of street pavements constitutes a very large item in the total municipal expenditure, and a careful study of the matter will usually disclose that, with proper care and management, the cost might be very largely reduced. The excessive cost of pavement maintenance may be due

to any of the following causes, or to a combination of some or of all of them : —

1. Inefficient organization and supervision.

This cause is more or less common in nearly every city. The street repair department will usually be found to be the fag end of the municipal organization. Any broken-down political hanger-on is considered good enough to manage it, and the foremen employed are usually of a like character, — men whom no good contractor or business man would employ under any circumstances. As a result the department is without efficient organization or competent management.

2. The labor employed is of the poorest class. The street repair force is too frequently the haven into which drifts the riffraff and offscourings of the city's laboring population. It is used as a means of dispensing charity to the semi-helpless classes, — those who cannot get other jobs because they cannot or will not do efficient work. When a so-called laborer is just a little too good to be sent to the poorhouse and not good enough to get employment from those who expect a fair day's work for a day's wages, he is by common consent put into the street repair gang. It may be charity, but it is the most expensive kind of charity, as a little observation will show. One has but to watch for a few minutes the movements of the ordinary gang of street repairers, to understand why the work costs so much more than it should.

3. Lack of promptness in making repairs. Small defects in a pavement that could be repaired, at a trifling cost, when they first appear, will usually develop quickly, under the stress of heavy travel, into yawning

holes, to repair which will require the expenditure of dollars, when the expenditure of cents at the proper time would have been sufficient.

4. Repair work is often improperly or imperfectly done with inferior materials, with the result that the same repairs are often made over and over again.

5. Large sums are wasted in patching up old pavements that are not worth repairing. The cost of maintaining a pavement, or any other public work, increases with its age, and in each individual case there must come a time when the cost of maintenance is so great that it will be cheaper to reconstruct the work than to continue making repairs. This point is reached, of course, when the cost of maintenance exceeds the cost of reconstruction. To illustrate: let us take the case of a street the repavement of which will cost $10,000. We will assume that the reconstructed pavement will last with usual repairs for a period of fifteen years. If the rate of interest is five per cent, the interest charges against the new pavement will be $500 per year, and to create a sinking fund which will extinguish the debt incurred (at the same rate of interest) will require $463.40 per year, and the cost of ordinary repairs may be $300 per year, making a total charge of $1263.40 per year. It must be evident that whenever the cost per year of maintaining the old pavement exceeds this sum, it will be economy to replace it with a new one. In this computation we assume that the old pavement would be as economical in use as the new one, which can be true only when the old pavement is maintained in as good condition for use as would be the new, — a condition which is practically impossible. Consequently, the incon-

venience to the public, and the additional cost of travel over the old pavement, becomes an important element in the problem, though it is one not capable of accurate computation. As the surface of the old pavement becomes more and more rough and irregular, not only will the cost of hauling loads over it increase, but the wear and tear on horses and vehicles will increase in a still greater ratio. Those who have studied the matter most carefully are convinced that this consideration, rather than the bare question of relative cost of maintenance or reconstruction, is by far the most important, and if so, streets should be repaved long before the naked cost of maintenance equals or exceeds the cost of reconstruction.

All these causes of excessive cost of street repairs are clearly such as can easily be remedied. All that is necessary is to apply to the department of street repairs simple and well understood business principles. The department should be organized, equipped, and managed with the same care as any other department of municipal work. When this shall be done, we may expect a large decrease in the present cost of maintaining pavements in nearly all our American cities.

If for any reason it is thought impracticable to secure the best results through doing the work by the municipality direct, the plan of having street repairs done by contract may be adopted. This has been tried in a number of cities and, under proper requirements and restrictions, has given good results. Such contracts may be made at a lump sum price per year, or at a price per square yard, as may be most convenient, but contracts

should not extend over a longer period than five years. In the changing conditions of our American cities, no one can foresee and figure very safely upon a longer period. On the other hand, a much shorter period, say one or two years, is unsatisfactory, since the contractor cannot economically provide the proper plant and organization when its cost must be distributed over so short a period.

It is quite certain that under a well-devised system of contracting for street repairs, most cities could reduce very materially the cost of that work, without any deterioration in the quality of work done. Where the pavements have been laid under a time guaranty by the contractor, he can usually be depended upon to assume the responsibility for and to exercise proper vigilance in making repairs, and the duty of the officers of the municipality will usually be discharged when they see to it that the contractor lives up to the requirements of the guaranty.

Whatever system may be adopted, it is very desirable that accurate accounts should be kept of the money expended in the repair of any public work, and these accounts should be subdivided and itemized so that the cost can be intelligently analyzed. In the case of streets, separate accounts should be opened with each street, or the accounts should be so kept that the amount expended on each can be readily ascertained. If this were systematically done, a mass of information relating to the relative cost of maintaining pavements of the different kinds under different conditions of use, would soon be accumulated, which would be of the greatest value in determining the relative economy of the sev-

eral kinds of pavements under various conditions of travel and treatment.

The maintenance of other kinds of public work is of a somewhat different character from street repairs, and, while demanding close attention, may not require a special organization; but the facilities should, of course, be readily at hand for making prompt repairs when they are needed.

The water department is a frequent sufferer because of tardiness in making repairs to pumping machinery, street mains, and other parts of its plant. The powers that control appropriations seem frequently to think that as long as an engine will pump water it is in good enough condition, and money need not be expended upon it. The fallacy of such an assumption should be evident to any intelligent person. True economy consists, as every mechanic and mill owner well knows, in making small repairs promptly, in order, if for no other reason, that much more expensive repairs may be avoided later. It is poor economy to put off repairs that might be made this year for one dollar, until next year, when they will cost four dollars, even if the machine may not have been permanently injured or ruined in the meantime by the neglect; to say nothing of the greater cost of the service rendered by it while out of repair.

There should be in every city a system of regular and periodic inspection of all public work, in order that needed repairs may be promptly discovered and made. This inspection can safely be intrusted to the official having charge of each class of public work. Inspectors should make written reports, whether defects are dis-

covered or not, in order that a complete record of the condition of the works may be maintained.

One of the important, and sometimes one of the most troublesome questions to be dealt with in the management of public works, is the procurement of necessary materials and supplies. Because it has been found that the purchase of these supplies has sometimes offered opportunity for bad judgment, extravagance, and dishonesty, it has been attempted, in many cities, to restrict and regulate the purchase of supplies by so many precautionary requirements that to procure them of the necessary quality and at the time they are needed has become a very troublesome problem. However honest, competent, and careful the head of a department may be, he is not usually allowed to purchase his supplies, as the head of a private business may do, in the open market, at such times, in such quantities, and at such prices as will in his judgment be to the best interest of the corporation.

In most cities it is required that for all supplies and work aggregating a certain sum and over, proposals must be advertised for, received, opened, and contracts awarded. In most cases this is entirely practicable and proper, but it is frequently the reverse. It is for many reasons not always possible to foresee and provide by this process all the supplies that may come to be urgently needed, and needed at once, under some unexpected contingency, and great inconvenience and often serious loss is the result. On the other hand, if it is attempted to procure by the prescribed process such a variety of supplies, and in such quantities as may *possibly* be required

to operate the department, its head may very justly be open to the charge of extravagance, since he may thus lead the municipality to purchase articles that may never be used, or that may not be needed for a long time to come. In the interest both of economy and of good service, therefore, some modification of the present practice in many cities should be devised and adopted.

It would seem that in the larger cities a purchasing department might be organized, with a man of undoubted integrity as well as ability at its head to whom the necessary latitude might be allowed to supply the requirements of the several departments, in such manner as the conditions and contingencies might make necessary and practicable. Through this purchasing department the requirements of the various departments could be consolidated, so that many supplies could be bought in larger quantities, and therefore at lower prices, than if purchased in smaller quantities upon the requisition of each department. The purchasing agent would, of course, advertise for proposals and award orders to the lowest bidder, whenever that method of purchase should be found admissible. Specifications would be prepared, and, wherever practicable, samples of the kind and quality of supplies required would be exhibited to prospective bidders, which samples would be preserved, and the successful bidder would subsequently be required to duplicate them in filling the order. Our cities might with great advantage study and follow in this matter the admirable systems prevailing in the purchasing departments of large business corporations and the great railroads, particularly that of the Pennsylvania Railroad Com-

pany, where the system of purchasing supplies has been brought almost to perfection.

In connection with the supply department of every city there should be a well-equipped technical laboratory, where the kind of supplies best suited for their several purposes may be determined, and the quality of those delivered under orders, or used by contractors upon public works, tested, to ascertain if they come up to the standard specified. The cost of equipping and maintaining such a laboratory would be returned almost every year in cities of any considerable size, as has been demonstrated in those cities where such laboratories have been instituted. Their field of usefulness in public work is very large. Questions as to the good or bad quality of stone, brick, asphalt, cement, sand, and other materials to be used in street paving and other construction work, of gas supplied by gas companies, of the purity of the water supply, and of the purity and excellence of all kinds of supplies, might there be settled conclusively.

CHAPTER X

ECONOMY, REAL AND FALSE

THE enormous expenditures of our cities for the construction, operation, and maintenance of their public works, as shown in the first chapter of this book, at once suggests the inquiry whether or not it is possible, by more economical administration, to reduce these expenditures. A saving of even five per cent would mean, in the 135 cities referred to, a reduction of $13,129,140 in their total annual disbursements, equal to nearly 69 cents for each man, woman, and child of the population. To the average family of six persons this would amount to an annual saving in taxes of $4.14—a sum not to be lightly disregarded.

We have no definite data upon which to base an assertion that such a reduction could be made without detriment to the several branches of municipal public service, or to any one of them; but the close observer of the business methods of the average municipality would be inclined to the opinion that at least two or three times five per cent could be saved by such management as the average business man applies to his private business.

It would not be possible within the limits of this book to go into this subject in detail, even if we possessed the data necessary for a thorough investigation; but it may be considered in a general way, and some examples given of what seems, to the ordinary observer, to be promising

opportunities for the exercise of greater economy in the administration of public works.

To one who undertakes even a casual study of the relative cost of municipal public work or service, the great discrepancy in the unit cost of any one kind of work in different cities must excite surprise, and the conclusion must be forced upon him that if the statements made public are correct, the service must be very poor and inadequate in some cities, or that in others the cost must be very excessive. Some few examples may be given by way of illustration. The figures used are from the report of the Department of Labor, Bulletin No. 80.[1]

The cost of street cleaning and sprinkling in a number of cities of the United States having a population ranging from about 200,000 to 350,000 appears in the table below.

TABLE SHOWING COST OF STREET CLEANING AND SPRINKLING IN SEVERAL CITIES

City	Population, 1900	Sq. yds. paved streets	Total cost of street cleaning and sprinkling	Cost per capita	Cost per 100 sq. yds. of paved streets
Buffalo, N. Y. .	352,387	6,301,778	$185,215	0.384	2.146
Cincinnati, O. .	325,902	6,210,003	189,956	0.582	3.059
Pittsburg, Pa. .	321,616	3,960,000	153,116	0.476	3.866
Detroit, Mich. .	285,704	5,246,436	147,381	0.516	2.809
Milwaukee, Wis.	285,315	8,072,537	142,810	0.500	1.769
Washington, D.C.	278,718	5,048,277	161,742	0.580	3.205

[1] These figures are taken from the Bulletin for the year 1900 (No. 30) because that for 1901 (No. 36) does not give the area in square yards of paved streets in the several cities, the length in miles of paved streets being substituted.

This is a very interesting table, but the reader must be cautioned against placing too much reliance upon deductions made from it. It is not doubted that the Department of Labor made every effort to collect and present accurately the facts; but the figures are subject to so many possible amendments as to make them, without further information, of uncertain value for purposes of comparison. It is obvious that different systems of account keeping might make a wide difference in the apparent results. In some cities street sprinkling is paid for from municipal funds; in others it is paid for by the private persons owning or occupying property fronting on the street, in which case the cost does not appear in the above table. There is a material difference in the cost per unit of cleaning and sprinkling pavements of the several different kinds, and one kind may predominate in one city and a different kind in another. The figures used in the table are based on the area of paved streets alone, while in each more or less money is expended on cleaning and sprinkling unpaved roadways, and the ratio of paved to unpaved streets may differ widely in different cities. Besides all these, there is quite a wide difference in the standard of cleanliness maintained in the different cities.

Yet when allowance is made for all these differing conditions, it does not seem possible to account for the apparent fact that to clean and sprinkle 100 square yards of pavement should cost $1.77 in Milwaukee and $3.06 in Cincinnati, or that the same kind of work should cost $.38 per capita in Buffalo and $.58 per capita in Cincinnati, on any other assumption than that there is a

wide difference in the economy with which the work is conducted in the different cities.

Equally surprising results may be reached by comparing the reported cost of other kinds of public work in different cities, but in every case the data are too indefinite to make the conclusions of very much value. At present no two cities keep their accounts on the same basis, and consequently any reliable comparison of the cost of work, one city with another, is impossible. If a standard system of uniform accounting could be adopted and used in all cities, and if these accounts and the reports made from them were in such detail as to make the results comparable, it would be possible to arrive at intelligent conclusions as to the relative economy of similar work and service in the different cities, and it would then be possible to fix the responsibility for careless or extravagant management. The adoption and use of a uniform system of accounting is therefore one of the most important measures that is now occupying the attention of those most interested in civic improvements.

That large sums of money are squandered yearly in our cities is a fact patent to every competent observer. This may not always be due to gross negligence, or incompetence, or dishonesty on the part of officials charged with carrying out public works. It is often due to the fact that sufficient thought, care, and skill are not devoted to the matter, and questions of immediate and ultimate economy are not studied as thoroughly as in enterprises of equal importance and magnitude carried out by private business corporations. It is a conceded fact that the industrial advancement of the United States, and our

commercial supremacy in industrial matters, is the result of strict and intelligent economy in every detail of our industrial work, and the low cost of production which we have been able to attain is the result of the aggregate of many small economies rather than of large saving in any one item. The same system applied to our public works would undoubtedly result in the saving, in the aggregate, of very large sums in their construction and operation.

It is true that city officials are not always left free to use their best business judgment in these matters. Besides the distrust and suspicion with which the public seems uniformly to look upon any operations of magnitude proposed by city officials, there is always a certain considerable element in every community which opposes any new or radical change in what it calls the good old way of doing things, and many meritorious reforms that would undoubtedly greatly benefit the whole population are often effectually blocked because of this blind and unreasoning opposition. It is only in rare cases, under our form of government, that the most intelligent and honest officials can hope for the success of the most meritorious measures in the face of the determined opposition of even a strong minority of the public.

A notable example of this, just now prominently before the public, is the prevention of waste of water in our cities. It has long been notorious that in some cities the consumption of water, in gallons per capita, is more than double that in others. Careful investigation has shown conclusively that this discrepancy often does not result from the fact that more water is actually required,

or used, in some cities than in others, but that it is due almost entirely to wastage. The waste of water is due to a number of causes, among which are leaking mains and service pipes, defective plumbing, and leaking reservoirs. It is well known, however, that by far the greater part of the loss is due to wanton or careless waste of water by those who are supplied.

It is usually possible to discover and repair leaking pipes and reservoirs, and careful inspection and vigorous measures may do something to prevent waste by consumers, but when all is done that can be done in these ways it is found that the waste goes on to an alarming extent. Being long accustomed to pay for water privileges under a schedule that does not take into consideration, except in a rough way, the actual quantity used, the average consumer has grown to believe that he has the right, not only to use but to waste all the water he pleases, and he resents any attempt to curtail or limit that right. He has grown to assume that "water should be as free as air," and that therefore there exists no good reason for economy in the use of the one more than in the use of the other. It should require no argument to convince an intelligent man that such reasoning is fallacious, and that even air, if it costs the city money to supply it, should be economized, but the prejudice of even the more intelligent against any attempt to limit the use of water is so great that remedial measures are almost always opposed. The love of getting something for nothing, or for less than cost, is very strong in human nature. It is evident that the only effective remedy for the waste of water is some plan under which each consumer shall be required to pay

for the actual quantity of water that he uses or wastes, and this means that the water supplied to him shall be measured and charged up to him at a stipulated price per unit. The water can be accurately measured by a water meter attached to each tap, and consequently those most interested in reducing the cost of public water supplies very strongly advocate the general introduction and use of water meters; but to their surprise they find themselves confronted with the strongest opposition by the public, whose interests they are conscientiously trying to serve. As a business proposition nothing could seem more reasonable than that the expense of supplying a commodity to the public should be borne by its individual members in the ratio of the quantity supplied to each. If of two adjoining neighbors, the one has sufficient regard for the interest of the municipality to impel him, while using all the water he actually needs, carefully to prevent any waste, while the other, through reckless waste, consumes double the quantity, it would seem but ordinary justice to charge the latter twice as much as the former. The common argument that the use of meters would unduly restrict the use of water by the poorer classes, is not only improbable on its face, but is disproved by experience. The opposite is more likely to be true. The community at large must ultimately pay the cost of all water supplied. If by preventing waste the quantity of water supplied may be reduced one-half, the aggregate cost will be reduced in something like the same ratio, and water rates may be reduced accordingly, and the poor man should get all the water he needs for less money than he now is forced to pay, and therefore could afford to use it more lavishly.

By private Companies?

From whatever point the matter is intelligently viewed, the conclusion is forced on the mind that the general introduction and use of water meters should be encouraged and enforced, and yet it is surprising how strongly their introduction is opposed by the public.

The prevention of waste is the most promising field for economy remaining in this department of the public service. Engineers have devoted a great deal of study and experiment to reducing the cost of pumping water, and the almost perfect modern high-duty pumping engine places this part of the service where possible economy is measured by fractions of a cent per thousand gallons. The cost of constructing and operating distributing systems has also been reduced very close to a minimum, but these small economies avail little if one-half the water supplied is wasted. Of course, the public will in time become educated to understand and appreciate the importance of this matter; and city officials and public-spirited citizens should make every possible effort to promote correct views upon the subject.

There are not a few American cities where, because of careless waste, the supply of water has become apparently inadequate, and additional supplies, which can only be secured at great expense, are loudly called for. In not a few of these cities the present supply would be ample if meters were used and reckless waste thus prevented, and the large expenditure for additional supply would thus become unnecessary for many years in the future.

While it is not the purpose of this book to go largely into statistics, it seems desirable that this subject of

water-waste prevention by the use of meters should be placed before the public at every opportunity, and some figures illustrative of the statements made above are therefore presented.

Mr. George I. Bailey, C.E., Superintendent of the Bureau of Water, in Albany, New York, has recently gathered a large mass of statistics, with the view of ascertaining the consumption of water per capita in the various American cities, and the effect of the use of meters in reducing that consumption, and the results of this investigation were published in *The Engineering News* of April 18, 1901.

The figures for a number of cities are given below: —

Cities	Population, census of 1900	Per cent of taps metered	Consumption per capita
Philadelphia, Pa.	1,293,700	0.5	229
Providence, R.I.	175,597	82.6	54
Worcester, Mass.	117,421	94.3	70
Boston, Mass.	560,900	5.5	143
Buffalo, N.Y.	352,400	1.6	233
Detroit, Mich.	285,700	10.0	146
Milwaukee, Wis.	285,800	67.6	80
Kansas City, Mo.	163,750	40.0	62
Denver, Col.	133,859	7.6	121
Memphis, Tenn.	102,380	8.3	125
Atlanta, Ga.	89,872	91.6	84

It will be noticed that in these cities the consumption per capita decreases very rapidly as the percentage of taps metered increases. Compare the heavy consumption in Philadelphia, Boston, and Buffalo, where less

than 6 per cent of the taps are provided with meters, with that of Providence, Worcester, Milwaukee, and Atlanta, where from 67.6 per cent to 94.3 per cent are metered. The contrast is very striking, and, even if we make proper allowance for the increased consumption due to the larger size of the unmetered cities, it is clear that the meters have effected a very large economy.

Averaging the consumption in all the cities investigated, and classifying them with regard to the percentage of taps metered, Mr. Bailey arrives at the following significant results.

The average consumption per capita is: —

In the cities where less than 10 % of taps are metered .	153 gals.
In the cities where from 10 % to 25 % of taps are metered .	110 gals.
In the cities where from 25 % to 50 % of taps are metered .	104 gals.
In the cities where over 50 % of taps are metered	62 gals.

These figures seem to warrant the assertion that the general use of meters would reduce the consumption of water to at least one-half, and possibly to one-third, of the quantity it is necessary to provide where their absence allows waste to go on unchecked. As it appears, from the figures given in Chapter I, that the present cost per year of operating and maintaining water supplies in cities of 30,000 or more population is over fourteen and a half millions of dollars, it is safe to conclude that the general adoption of water meters would result in a saving of from five to seven millions of dollars annually in the cost of supplying water to these cities.

Among our municipal public works it would seem at a first superficial glance that street pavements are of the simplest

character, and present less opportunity for the application of the principles and practice of economy than does any other branch of municipal work. Perhaps this seeming simplicity may account for the fact that less attention is ordinarily given to the study of this branch of public work than to any other. Whatever may be the cause, I unhesitatingly assert that no branch of municipal work has been so greatly neglected, and that none offers such a promising field for the exercise of large economies.

The primary function of paved roadways is to supply a hard, smooth, and durable surface over which the vehicular business of the city may be conducted with the least expenditure of power. Other minor functions are of secondary importance. When an engineer designs a bridge, the first question that must be considered is the loads to which the structure will be subjected, and when this is ascertained, the bridge is proportioned in every part to carry safely that load. The same principles should be applied in designing roadway pavements, though the problem is not quite so simple as in the case of the bridge. Not only must the *quantity* of travel to which the pavement will be subjected be considered, but the *character* of that travel must also be taken into consideration; as well as some other requirements of importance. But all the requirements being known, the pavement should be scientifically designed to meet them. In other words, it should be treated as a purely commercial and engineering problem, — the designing of means to meet certain ends, — and the whole treatment of the problem should be based on business considerations. Naturally the first question that will arise is, What is likely to be the quan-

tity and character of the travel to which the street pavement will probably be subjected? The street may be in the active business district of a large city, where thousands of vehicles of various classes carrying heavy loads will use the pavement daily, or it may be in an outlying residential district, where a few carriages and the vehicles of the tradesmen who supply the wants of the residents will ordinarily constitute the only traffic to be accommodated. It should be obvious on a moment's thought that the two streets admit of and require entirely different modes of treatment. In the first case, the paved portion of the roadway should be made as wide as the boundaries of the street will permit. In the second, however wide may be the street, the quantity of travel will require a paved roadway only wide enough to allow the few vehicles used to pass each other safely. But here an extravagant blunder is often if not usually made. Wide *streets* in residence districts are desirable and advisable for reasons not here necessary to enumerate; but it does not follow that wide *paved roadways* are necessary or advantageous. Yet it is a very common practice to apply to such streets the same treatment as to the heavy-travelled business streets. Thus, on a residence street eighty feet wide between property lines, it is customary to locate the curb line from twelve to sixteen feet from the property lines, thus leaving a roadway from fifty-six to forty-eight feet in width, and when a permanent pavement is constructed it is customary to pave this whole width of not less than forty-eight feet. A paved roadway thirty feet wide would undoubtedly furnish the most liberal accommodation for all the travel on the street, and the money spent

in paving any additional width is absolutely wasted. Indeed, it is worse than wasted, because this additional width of paved roadway will increase, in the ratio of its width, the cost of maintaining, cleaning, sprinkling, and otherwise caring for the pavement. Not only so, but the narrower pavement practically adds to the useful depth of the abutting lots. The area not occupied by the pavement may be set in grass or flowers, and thus enhance the beauty of the street. The cost of the pavement per square yard would be practically the same whether proved forty-eight or thirty feet wide, and consequently the wide pavement would cost the city or the property owners sixty per cent more than the narrow pavement. Assuming that the street is half a mile long and that the cost of the pavement is $2.40 per square yard, the saving in the total cost of paving it would be more than $12,500; or to put it in a different form, the improvement might be continued three-tenths of a mile farther at the same cost if the narrow pavement were used instead of the wide. We have assumed for this street the maximum width that the conditions would require. As a matter of fact, the paved roadway might often be reduced to a width of twenty-four feet instead of thirty feet, and it would still be amply wide to accommodate the actual needs of the travel. It may be objected that carriages and other vehicles could not turn around in a street twenty-four feet wide. Many of them doubtless could not, but with blocks of the usual length such vehicles could go around the block, or the street *intersections* could be widened out so that turns could be made there. It is a very moderate statement to say that many millions of dollars have been

squandered, or worse than squandered, in American cities by making the pavement on roadways of residential districts unnecessarily wide.

Again, the character of the pavement that will supply most economically the requirements of any street must be carefully studied. A pavement should, in the main, be considered from a business or economic standpoint. That it is poor business to use on a light-travelled residence street the same character of pavement that is necessary for a heavy business street, ought to be obvious to the dullest; and yet we see the principle frequently disregarded. While it is true that we have not yet the data necessary to deal with this question with scientific accuracy, it may be safely predicted that the time will come when engineers will devote to the street-paving problem something like the same scientific treatment that they now apply to railroad construction and bridge building. In the meantime, we have sufficient information and data to enable us, aided by good business judgment, to avoid most of the economic blunders in street-paving that are now so common.

The selection of the *kind* of pavement to be used on any given street is a matter of importance, deserving much more attention and study than it usually receives. I have no intention of going into the subject of the relative merits of the several varieties of street pavement now before the public, but wish only to call attention to the necessity of considering the matter from an economic point of view, and to give some illustrations to show that it is a question that should not be decided offhand, or without careful study and intimate acquaintance with the subject.

The true cost of a street pavement, excluding all questions of the relative economy in use, and considerations of beauty, comfort in use, etc., is made up of a number of items as follows:—

(1) The first cost of the pavement. (2) The cost of keeping it in repair. (3) The cost of keeping the roadway clean. (4) The life of the pavement. (5) Interest charges on the sum invested. (6) Cost of renewal when the pavement is worn out. All these elements must be taken into consideration in order to determine which of two or more kinds of street pavement is, aside from other considerations, most economical. It will not do to base a conclusion on either the relative first cost or the relative durability (life) of the pavement alone.

As an example let us compare two pavements proposed to be used under similar conditions. We will assume that the street to be paved is a business street in one of the smaller cities, having a rather heavy travel. For the pavements to be compared, we will take a first-class macadam, as representing the cheapest in first cost, and sheet asphalt as representing one of the highest priced pavements in common use. While we have not the necessary data to give absolutely accurate figures, those given below may be taken as representing a fair average in American cities at the present time. Prices will, of course, vary in different localities with the cost of materials and with differing conditions under which the work must be done. Whether we accept those here used or not, they will serve to illustrate the correct procedure in determining which, under given conditions, is the most economical pavement to use.

TABLE ILLUSTRATING APPROXIMATELY THE RELATIVE ULTIMATE COST PER SQUARE YARD PER YEAR OF MACADAM PAVEMENT AND SHEET ASPHALT PAVEMENT UNDER SIMILAR CONDITIONS

	Macadam	Asphalt
Probable life of pavement, years	6	15
First cost of pavement per sq. yd.	$1.10	$2.40
Cost of maintenance in good condition during life	.60	.60
Interest on first cost during life at 4 % . .	.26	1.44
Interest on cost of maintenance at 4 %, assuming that this cost is distributed evenly over the life of the pavement. .	.07	.18
Cost of renewal with same kind of pavement at end of life	.60	1.40
Total	$2.68	$6.02
Annual cost during life of pavement, per year	.45	.40

It thus appears, if our figures are correct (and they are based upon present experience), that while the first cost of the asphalt pavement is more than double that of the macadam, the ultimate cost of the first is materially less than that of the second.

We have considered only the first cost, and cost of maintenance and renewal. There are other equally important considerations that must be taken into account in arriving at the true relative economy of various pavements. Among the more important of these are: the relative power required to haul loads over the pavement and the consequent difference in cost of transportation; the facility with which the pavement may be cleaned, and the difference in the cost of cleaning, which varies con-

siderably with the different pavements; their relative qualities from a sanitary standpoint, and the numerous qualities that determine the relative comfort and convenience of each in use. We shall not consider these in detail, the object being only to point out that in this neglected department of street-paving there is ample opportunity for the exercise of the principles of true economy.

It should be borne in mind that true economy does not necessarily mean low first cost. It may and often does mean quite the opposite. Cities must, of course, sometimes cut their coats according to the cloth, and respect for a proper debt limit and a reasonable tax rate will often prevent them from doing that which would be clearly the most economical, judged by ultimate results. For this reason it is wise for the municipality to avoid engaging in too many business enterprises, in order that ample capital may be had for the handling, in the most economical manner, of those it does undertake. An antiquated and decrepit pumping engine may be capable of supplying all the water required for many years to come; but if it appears that a modern machine of the best type will do the work at so much less cost for coal, attendance, and repairs as to make it profitable to throw the old machine in the scrap pile, this should be done at once. If this policy were pursued, many a venerable pumping engine now in use would soon disappear.

The modern manufacturer practises real economy when he promptly displaces an inferior machine, possibly almost new, by one of later design, that will effect even a small saving in cost of the work turned out.

We might pursue this subject much farther, but enough has been said to show that there is a wide field for the exercise of economy in the department of public works, and to point out some of the directions in which it may be applied.

CHAPTER XI

GUARANTEEING PUBLIC WORK

THE practice of embracing in contracts for municipal work, particularly those for street-paving, a provision that the contractor shall guarantee the work done by him for a number of years, has become very common, and the tendency to require these guaranties seems to be growing. Whether such guaranties are, on the whole, beneficial to the interests of the municipality or not, is a question that admits of argument on both sides. At first thought it would appear that the municipality has everything to gain and nothing to lose; but the question has not been pursued to its ultimate consequences, and the whole problem has not been worked out with the care its importance deserves. If it be granted that it is proper and wise to require and enforce a guaranty, it must be admitted that the language of the contract in which the conditions of the guaranty are expressed, is often so loose and indefinite on the one hand, or so sweeping and so obviously unjust on the other hand, as to make its application to actual conditions difficult if not impracticable. A brief consideration of the whole subject may therefore be of interest.

We need not include in the discussion those short-period guaranties, required by many cities, to the effect that any defective work appearing within a brief period,

usually six months, must be made good at the expense of the contractor, nor those which require that machinery furnished shall accomplish stipulated results. Such guaranties are reasonable and proper, and there can be no valid objection to them. Nor is it intended to discuss such guaranties as are required in the case of untried varieties of material, or novel methods of doing work, the value of which have not been sufficiently determined by experience. It is, undoubtedly, proper and advisable to require that the advocate or promoter of a new material, or a new method of performing work, shall make good his faith by giving a satisfactory guaranty. In fact, conditions of this character were probably responsible for the introduction in this country of the practice of requiring the contractor to guarantee his work. In the early history of asphalt pavement, as constructed in this country, there was no little want of confidence in the pavement, and much misgiving as to its durability. Its promoters had great confidence in it, and were quite willing to meet the popular distrust by offering to maintain the pavements for a period, usually five years, after their construction, and to guarantee that the work would be in good condition at the end of that period. The practice thus begun was adhered to after the character and durability of the pavement became well established, and is still persisted in, and it has become common to require similar guaranties upon other kinds of pavement, and also, to some extent, upon work other than street pavement.

The general theory upon which the contractor is required to guarantee the work done by him for a period of

years is, that under such a requirement the responsibility for the good and sufficient quality of the work done and the materials used, is largely shifted from the city to the contractor, since his self-interest must compel him to perform his work in the best possible manner, in order that it may endure through the period guaranteed, and be accepted by the municipality at the expiration of the period. It is argued that under such a requirement the contractor cannot afford to slight his work, because the consequences will eventually fall upon him, and he and not the municipality will suffer for any carelessness or bad work that he may allow.

In actual practice, as we shall note later, the guaranty requirement has been made to cover a much larger field than the construction of the work in a proper manner and with proper material, and in most cases it now amounts to a contract to maintain the work for the period named, and in not a few cases to the assumption of the risk of accidents and unforeseen causes of deterioration for which the contractor cannot reasonably be held responsible.

Without at present questioning the soundness of this general theory, let us examine its practical workings and endeavor to determine whether or not the municipality receives in the end any substantial benefit therefrom.

In the first place, it must be recognized that the value of such a guaranty will depend upon the ability of the municipality to enforce compliance with its terms. To insure such compliance, two methods are in common use. One of these is to withhold from the contractor a part of the money that would otherwise be due him on the com-

pletion and acceptance of the work, until the guaranty has expired. This method will prove effective if the sum retained is large enough to constitute a sufficient surety. In practice, in contracts for street-paving, the amount retained is usually some per centum of the whole cost of the work. In contracts requiring a guaranty for five years, the usual amount retained is ten per cent of the value of the contract. Assuming that the contractor will be governed by purely mercenary motives, he may be depended upon to make good the guaranty, and do all work necessary for its integrity, provided the cost to him of doing so will be less than the sum he will receive at the expiration of the period. If, however, he finds that the cost of maintaining the work will exceed that sum, it will obviously be to his interest, aside from any question of business honor, or any care for his business reputation, to default, and unless the municipality has other surety in addition to the ten per cent retained, it will, as a rule, have no power to compel him to make good the guaranty.

It is evident, therefore, that the sum retained must be sufficiently large to insure that the contractor will find it to his interest to maintain the guaranty rather than to forfeit the money retained. But in the case of carelessly or improperly constructed street pavements, it is not unusual that the work, if the period of guaranty is long, must be extensively repaired or even reconstructed during the guaranteed period, and it may occur that the cost of repairs or reconstruction will almost, if not quite, equal the original contract price; and the cases are quite frequent where it will equal one-half that price. If, then, the municipality is to be fully secured, it would seem that

not less than fifty per cent of the contract price must be retained. But if one-half the value of the contract is to be withheld from the contractor until the expiration of the guaranty period, it is evident that only those with a large surplus of capital can undertake work of any considerable magnitude at prices yielding no more than a reasonable profit, since the sum left in the hands of the municipality would soon cripple the resources of those of moderate means; and under such conditions this class of contractors must either decline to undertake contracts, thus limiting competition, or they must bid prices that are sufficiently high to at least meet the actual cost of the work out of the immediate proceeds. In either case the result is likely to be disadvantageous to the city, since it is not good policy to stifle competition by shutting out the contractor of small means, who may be otherwise acceptable, nor to pay higher prices for work than are sufficient to afford a reasonable profit.

The other method referred to is to require the contractor to give bond in a sufficient sum to cover all possible liability. As such a bond must run for a period of years, personal sureties cannot be safely relied upon, since an individual who is wealthy to-day may be a pauper before the end of five years; and the only reliable surety must be that furnished by responsible surety companies. These companies are naturally averse to underwriting bonds, even for contractors financially strong, extending over long periods of time and involving many uncertainties; and if they do so, they charge high rates for the service, which must be paid by the contractor. He must, therefore, necessarily charge such prices for his work as

will yield a sufficient sum above reasonable profit to meet these charges. There seems to be no practicable way by which the carrying out of the guaranty can be assured except by the imposition of a very heavy burden on the guarantor, and the experience of many cities has proved conclusively that the benefit expected from a guaranty is liable to prove illusive, unless it is backed up by an amount of surety that the contractor cannot afford to furnish without receiving very high prices. That forfeits under guaranty clauses have been less common than might be expected, is due largely to the circumstance that the work to which the guaranty has been most frequently applied — asphalt pavements — has been mostly done by large and responsible companies, whose interest in the business and its future would compel them to live up to their engagements, even were they otherwise disposed.

It has been claimed that contractors add little, if anything, because of the guaranty requirement, to the prices they would otherwise name; but the claim is untrue in fact. That the maintenance of the guaranty always costs something, and that in many cases the cost amounts to a large percentage of the contract price, is proved by the experience of every contractor, and must be obvious to any one. To contend that good business men, as most of these contractors are, do not consider this item of cost in framing their bids, and make a liberal allowance therefor, is absurd. It is true that the exigencies of sharp competition and a desire to control the business may often impel them to name very low prices, which apparently ignore the guaranty; but experience has taught them that the

cost of maintenance is an inevitable burden that they cannot hope honorably to escape.

It is very difficult to estimate in advance the cost of maintaining a pavement for a period of years. The contractor who undertakes it must, if he is prudent, figure safely, and he will, therefore, if he expects to stand by his guaranty, estimate the item at its maximum cost. He will be aware that the volume and weight of travel on any street before it is paved, may be no indication of what it may become after the improvement is completed, particularly if the parallel streets are not also paved. Instances in large cities might be given where streets with light travel and unimportant business have, after being paved, and before the expiration of the guaranty period, become leading business thoroughfares, and their volume of travel increased tenfold. The contractor will be aware that in our growing American cities no one can safely predict what changes will take place in the character and quantity of travel on a street in a period of five years, and much less in a period of ten or more years, and he will know that it is quite impossible, therefore, to estimate with any degree of accuracy what the cost of maintenance will be during such periods. The experience of the large asphalt-paving companies has taught them how dangerous and unsatisfactory such estimates may be; and while in their large business covering hundreds of streets in various cities, the general average cost of maintenance has not differed very widely from their expectations, many single streets might be named upon which the cost of maintenance has so greatly exceeded reasonable anticipations that the result must have meant bankruptcy to a

contractor of moderate means. It is safe to say that experience has shown and will continue to show to contractors, the difficulty of foreseeing and estimating the cost of maintenance of pavements, and that the tendency among them is to increase this item of cost in order to allow a safe margin for unforeseen increase of wear and tear. It must be evident, therefore, that the municipality must pay at a liberal rate for the benefit that the guaranty is supposed to give. Under these conditions it is more than doubtful if the municipality gains anything by requiring long period guaranties. It would seem better from a business point of view to separate maintenance from construction, and, if it is thought best to have pavements maintained by contract, to make separate contracts for the maintenance of each street for a comparatively short period, which should never exceed five years.

There is another feature of guaranties that must be considered. If a contractor is required to maintain a pavement for a period of years, care must be taken by the municipality to do nothing itself, and to prevent others from doing anything, that will relieve the contractor from his obligation. For instance, the municipality may not itself, nor may it permit others, to remove and then repair parts of a guaranteed pavement for the purpose of constructing railroads, sewers, or other underground structures, since not only may the contractor assert, and often truly, that the adjoining pavement was injured in the operation, but he may claim that defects appearing in the future may be within that part of the street disturbed and repaired by parties other than himself, and for which, therefore, he cannot be held responsible; and it is

generally difficult, if not impossible, to locate accurately, after the lapse of a year or two, the repairs made by those other parties. It is therefore found advisable to couple with the guaranty requirement a provision that the guarantor shall make all required replacements at a stipulated price. This price may be fair and reasonable at the time it is made, but during the life of the guaranty prices may greatly decline, so that the contractor may receive exorbitant compensation for all the repair work to be done. It is well known that, owing to the great decline in prices of asphalt pavement during the past few years, many cities are paying, and must continue to pay for many years to come, under existing guaranty contracts, very much higher prices for repairs than those prevailing at the present time. It is true that repairs of this character are usually paid for by the private persons for whose benefit they are made, and not by the municipality, but the loss falls on citizens whose interests it is the duty of the municipality to protect as far as practicable. It is true also that the movement of prices might be in the opposite direction, in which case the guarantor would have to shoulder the loss, and the municipality or its citizens would reap the benefit; but this does not invalidate the conclusion it is desired to present, — that it is not wise to make contracts extending over a long period of time for services or supplies the market price of which is liable to fluctuate within wide limits.

In view of all the facts, it may therefore well be questioned whether, in the end, the municipality is not the loser rather than the gainer through the operation of guaranties on public work. Whatever may be the answer

to this question, it is worth while to inquire if the end aimed at cannot be attained by some other means less objectionable to all parties concerned.

Assuming that the work contemplated is of an ordinary and well-known kind, or in other words that it is not of an experimental character; that the quality of the materials used can be readily determined; and that the degree of skill and the character of workmanship necessary to do the work properly are understood by the city's agents; and assuming further that the work will be awarded to a contractor of known character and responsibility, and that during its progress it will be properly supervised and inspected by the agents of the municipality, there should be no difficulty in securing its performance, so far as materials and workmanship are concerned, in a satisfactory manner. Especially may this result be expected when it is remembered that work done under a guaranty is not so likely to be carefully inspected, because the contractor, in that case, is supposed to assume the greater responsibility for the quality of the work.

In this connection it must be remembered that there must always be a question as to how far the municipality may dictate to a contractor who is required to guarantee his work. The contractor may claim that if he is to be held responsible for results, he must be free to exercise his judgment as to the best means of securing those results, and that if the municipality assumes to dictate methods, he, the contractor, cannot be justly held responsible for results.

The question of the legality of long-time guaranties has been often raised and deserves careful consideration.

Where public work, and particularly street-paving, is paid for partly or wholly by special assessments, the laws almost invariably provide that the cost of construction alone may be assessed upon the property owners benefited, and it is either expressly or by implication provided that the cost of maintaining the work, after it is constructed, shall be met from the general funds. It is therefore necessary to distinguish between repairs that may become necessary because of faulty materials or workmanship, and those which will inevitably become necessary because of the wear and tear of use, however well the work of construction may have been done. This latter class of repairs may properly be called *maintenance*. But the guaranty clauses in use in most cities are so drawn as to compel the guarantor to maintain the work in good condition during the period of guaranty, regardless of whether it was properly constructed or not; and it cannot be doubted that the contractor in framing his bid for the work adds to the price of construction a certain sum to cover the cost of such maintenance. In other words, the bid is made up of a certain sum for construction, and a certain other sum for the maintenance required by the guaranty. The property owner who may willingly consent to be assessed for the construction of the improvement, may object to having the cost of maintenance specially assessed upon his property. A number of cases involving this question have been brought before the courts, and a large majority of the decisions have been to the effect that contracts containing guaranties which involve maintenance of the completed work, are null and void. The decisions to the contrary effect are based

upon the argument that the terms of the guaranty do not necessarily require the maintenance of the work, in the proper sense of that word; but only that the guarantor shall do the work in such a manner that maintenance will not become necessary within the time stipulated; and if it shall become necessary to expend money for repairs, the fact is to be regarded as evidence that the contractor did not perform the work in the manner required, and must, therefore, make good the consequences of his failure. While this reasoning may possibly be accepted as satisfactory in theory, every man of practical experience knows that it is not justified in fact, since almost no street pavement subjected to even moderately heavy travel will endure for a period of five years, much less for a longer period, without expenditures for repairs that are clearly chargeable to maintenance, and which no fair-minded person could attribute to defective construction. This is tacitly admitted in many guaranty contracts by the use of the familiar phrase "ordinary wear and tear excepted," but this limitation increases rather than diminishes the difficulty. Who is to decide, who *can* decide, whether repairs made are due to original defects in material and workmanship or to ordinary wear and tear?

The fact is not overlooked that it may be proper and legally permissible to require a guaranty that a street pavement shall endure a certain amount of service and shall retain a capacity for further service; but unless the required service be clearly defined in unmistakable terms, who can say when the conditions have been met? A contract for a dozen eggs is definite, but one for a basket of eggs is not. So a contract requiring that a

pavement must be capable of carrying so many tons of travel would be definite; but one that requires that it shall carry all the travel that may come upon it for a certain period of years, regardless of the fact that, even if the present quantity of travel be known, no idea can be formed of what it may become during that period, is neither definite nor just. There must be some fairly definite quantity of travel that the pavement may be reasonably expected and guaranteed to carry without deterioration. Any additional quantity will make repairs necessary that cannot be said to be due to any want of integrity in the work. Such repairs are clearly chargeable to maintenance; and if the provisions of the law are to be complied with, their cost must not be specially assessed against the property owners. How shall the proper division be made? Take another view of the matter. The guaranty clause, as usually framed and used, is made to apply uniformly to all—or at least to many streets of the same city. But it must be obvious that on some of these streets, while the actual cost of constructing the pavement will be the same, the cost of maintaining (*i.e.* guaranteeing them) will be much greater than on others, and the contractor would make a corresponding difference in the prices he would bid. To illustrate: two parallel streets of equal width are to be paved, and contracts for the work are entered into, requiring that the contractor shall guarantee the pavements for, say, five years. The contractor proceeds to execute the work, using exactly the same materials, employing the same skill, and exercising the same care in the case of each, so that when the work is completed, the pavements are identical in all essential

respects. They should, therefore, be capable of enduring the same service under similar conditions. But one of the streets is, and will continue to be, subjected to three times as much travel as the other, and that travel is of a much more destructive character. It is inevitable that the effects of wear and tear upon the one will be at least three times as great as on the other. It may be that the quantity of wear and tear upon the lighter-travelled street will be such that the pavement will just endure to the end of the guaranty period without repairs, and be in acceptable condition at its expiration. If so, the pavement on the other street, having performed three times as much service, will have required extensive repairs, and will need to be virtually reconstructed before its condition will conform to the guaranty requirements. If the contractor was aware of all the facts when he submitted proposals to pave the two streets, and if he based his prices upon what the work would finally cost him, he doubtless bid a much lower price for the one than for the other. Why did he do so? Was it not clearly because he had reason to believe that on the one pavement he might expect that after the construction was completed he would be at the expense only of remedying such defects as may always be found to have crept into the work, while upon the other he must expect to expend a large sum of money for repairs made necessary by the wear of the heavy travel? And, if so, is it not evident that the difference in price is fairly chargeable to the maintenance of the pavement on the heavier-travelled street? It is almost certain that the property owner on that street would take that view of the matter, and might appeal to

the courts for redress. No such case has, I believe, been passed upon by the courts, but it is difficult to conceive how, on the facts presented, they could fail to support the view of the complaining property owner.

Some of the decisions of the courts that have upheld the validity of guaranty contracts in cases where it has been claimed that they involved maintenance do not impress the ordinary reader as being either candid or as going deeply into the equity of the question. They give the impression that they are founded on fine-spun legal theories rather than upon a broad and comprehensive view of the actual facts, and that the nice distinctions attempted to be made are far-fetched and irrational. As before remarked, the number of decisions of the higher courts covering this question is comparatively small, and a majority of these decisions have been against the validity of guaranty contracts. In most of the States the question seems not yet to have been brought before the courts, and is therefore undecided. It is safe to say that in the great majority of our cities the question of the possible invalidity of the guaranty contracts now common has not received the attention it deserves. The large companies by which a considerable part of the asphalt pavements in American cities have been constructed, have, for reasons of their own, been disposed to submit to questionable guaranty requirements rather than to have the practice of requiring guaranties abolished; but many who are best informed on the subject do not believe that the present practice could survive a serious onslaught upon it in the courts. A sweeping decision that such guaranties are illegal would be a severe blow to municipal corporations that have out-

standing a large number of such contracts, involving large sums of money; and common prudence would seem to dictate greater caution in the matter than has heretofore been exercised.

What is said above upon the legal aspects of guaranties applies, of course, only to those cities, or those cases, where the cost of the work is specially assessed upon the property owners. Where the work is paid for from the general funds, contracts clearly involving maintenance to any extent or for any number of years are, without doubt, entirely valid, and in these cases the question of requiring a guaranty is purely one of expediency.

Where guaranties extending over a period of years are required, it is important that the guaranty clauses of the contract should be more carefully drawn than has been customary in most cases in the past. While they should clearly and explicitly define what the contractor is expected to do, it is advisable to omit impracticable and unreasonable requirements which the municipality may not be able to enforce, and to avoid, as much as possible, the contingency of legal complications. The decisions of the courts indicate that where work is paid for from special assessments, a clear distinction must be drawn between repairs made necessary by the use of improper materials and workmanship, and those that may be properly classed as maintenance of the work. Such a distinction is not easy to define precisely, and its practical application is a matter of very great difficulty. In the case of a street pavement, for instance, repairs may become necessary from any one of the following causes: —

1. The failure of the contractor to do the work properly and skilfully with suitable material and workmanship.

2. The cutting out of the pavement for the construction and repair of other structures.

3. The accidental or malicious destruction of or injury to the pavement.

4. The wear and destruction of the pavement by use, which will occur to a greater or less extent, however well the work may originally have been done.

In the first case there can be no question about the duty of the contractor to make all necessary repairs under his guaranty. In the second, it is universally admitted that the repairs should not be covered by the guaranty, and that the contractor is entitled to compensation therefor. In the third case it is not only unwise but unjust to require a contractor to make repairs caused by accidental or malicious injuries to a pavement. While most cities seek to avoid including such repairs in guaranty contracts, there are not a few where the language of the guaranty still includes them, and where it is seriously insisted that the contractor shall make good injuries of this character. Neither the corporation nor the contractor can foresee or provide against such accidental injuries to the work, and the contractor has no police power to prevent the destruction of the work by its improper use, whether the result of malice or carelessness. Among accidental causes of injury may be named the breaking of water mains, the collapse of sewers, great fires along the street, etc. Protection against losses of this character is the function of insurance companies rather than of contractors.

Among other causes of failure of pavements may be

named the settling of trenches made by other persons under the direction of the municipality, but over the refilling of which the paving contractor had no control; the hauling of excessive and unlawful loads over the street; and, in the case of asphalt pavements, the escape of gas from the mains, and the building of bonfires on the street. The municipality alone has the power to prevent these things, and should, therefore, bear the responsibility for them; and while the contractor may, for various reasons, consent to make such repairs under his guaranty, there can be little doubt that if he chose to contest the question, the courts would sustain him.

It seems clear, therefore, that the only repairs which the contractor for constructing a pavement may be fairly required to make, under a guaranty, are those which may result from failure on his part to use suitable materials, and to do the work in a skilful and proper manner, in accordance with the provisions of the contract; or from the failure of the pavement to endure a stipulated amount of use. If it were possible clearly to distinguish repairs made necessary by defective materials and workmanship from all others, and to define and measure the amount of use expected of a pavement, it would be a comparatively simple matter properly to frame the guaranty provisions of the contract; but unfortunately it is difficult, if not practically impossible, to do so. This is well recognized, and both municipality and contractor understand that the guaranty requires that the pavement is to be maintained in good condition during the whole period, even if the repairs required are clearly due to travel, and not to defective material or unskilful work.

It is probable that the practice of requiring the contractor to give some kind of a guaranty upon street-paving work has become too deeply rooted to permit of its abandonment, unless the courts in the States generally shall pronounce it illegal, and even then some modified form of it, not forbidden by the law, will probably be adhered to. It cannot be denied that the principle of the guaranty has points of real merit, and possesses features that will continue to make it attractive while municipal contracting is in its present demoralized condition. It may be well, therefore, to inquire how far its meritorious features may be safely retained without danger of successful attack in the courts, and how its benefits may be retained while avoiding the objectionable features of present practice. The writer believes that this may be accomplished by separating the guaranty proper from any complication with questions of maintenance. It is universally conceded that a guaranty may extend over a period sufficiently long to disclose defects of workmanship and material, and yet not so long as to involve questions of maintenance, without any danger of legal complications. No question has ever been raised as to the propriety and legality of those short-term guaranties common in contracts for some varieties of public work, as, for instance, pumping machinery. They serve simply to disclose defects of construction or operation that could not be discovered in any other way. They would be as unobjectionable in the case of street pavements as in any other kind of work. The practical question is, What should be the length of the period of trial in order, on the one hand, that defects may be disclosed,

and, on the other, that no question of maintenance may be raised? This period may differ with the kind of pavement and the conditions to which it is exposed; but it may be safely assumed that any faults of material and workmanship should appear within two years, and that any standard pavement should ordinarily require no maintenance repairs within that period. Qualities of endurance could not, usually, be ascertained within that time; but a time standard is not the proper one to be applied in the determination of that quality in any case. When we consider that some streets carry more travel in one year than others do in twenty years, the absurdity of applying a fixed-time standard to measure their endurance must be apparent. Nor is it practicable to attempt to graduate the length of the period by the amount of travel on a street before it is paved, since that travel may increase very greatly after the street is paved and during the period fixed. It is known that, excluding the effects of natural decay, which may generally be disregarded, the life of a pavement is practically measured by the amount of travel over it. Roughly, we may say that its endurance is a function of the tons of horses and vehicles it carries. The rational way, then, to define the endurance of a pavement, is to stipulate that it shall carry a given number of tons of travel without showing signs of failure. This is so evident that it will not be disputed; but the objection raised to this method is the practical difficulty of ascertaining the weight of travel. It is true that to do this with great accuracy would be practically impossible; but experience has shown

that it may be determined with approximate correctness, and without very great expense. The average weight of a horse is known, and that of the various classes of vehicles, empty and loaded, can be approximately ascertained. If, then, a census of the travel over any street be taken, recording the number of horses and the number of vehicles of each kind, and noting whether they are empty or loaded, the weight of the whole can be approximately computed. If such a census be taken on a number of stated days in the year, the average weight of travel for the whole year may be ascertained. It will, of course, be but an approximation to the truth, but it will furnish a measure of the work done by the pavement and its endurance that will be far more rational and reliable than the rude assumptions based on a time standard. If we are ever to approach a reasonable method of specifying the life of pavements, it must be along such lines. The writer has had hundreds of such censuses of travel taken, and therefore speaks from experience as to their practicability and substantial accuracy in determining the work endured by different pavements. The data thus collected would be worth much more than they would cost in helping to solve problems connected with street pavements.

It is doubtful, however, whether it is either necessary or advisable, or even desirable, to introduce an endurance requirement in guaranties of pavement work. We know with fair approximation the relative lasting qualities of the several kinds of standard pavement, and it is practicable to frame specifications for their construction which, if carried out, will insure work of reasonable

uniformity; and the agents of the municipality have the necessary practical knowledge to enable them to enforce such specifications. With, then, a time guaranty covering a sufficiently long period to disclose defects of construction that may have been overlooked, we might confidently expect very satisfactory results.

But if it shall still be desired to make the contractor responsible for the care of his work over a longer period, this may be accomplished by having him name in his bid a price per square yard per year at which he will keep the pavement in repair for the desired number of years after the expiration of the two years of free guaranty. If there should exist any question of illegality, the cost of such repairs could then be paid out of the general fund, the cost of construction only being specially assessed against the property owners. Payment for the repairs would be made annually or quarterly, as the repair work should be done. This would be more equitable than the present practice, where the cost of maintenance being included in the construction price, the contractor receives the whole amount when the construction is completed.

In conclusion, it is worth repeating that this whole matter of long-time guaranties upon public work, and particularly in street-paving contracts, has not received the attention its importance warrants. It should be carefully threshed out, and its merits and demerits, its benefits and dangers, considered from the standpoint of the future as well as from that of the present.

CHAPTER XII

SPECIAL ASSESSMENTS

SPECIAL assessments, as a means of providing payment for municipal public work, are in quite general use, but the legal principles which underlie their theory and practice do not seem to be very well understood by the public and by many city officials. Recent opinions of the higher courts have emphasized the importance of conforming very strictly to the law in levying and collecting such assessments, and it is believed that a general statement of the principles involved and the requirements of the law relating to the subject may be of interest and value to those for whom this book is written.

The differing statutes of different states, and the varying provisions of municipal ordinances in different cities, make the subject a somewhat complicated one, especially where these laws and ordinances must be interpreted in the light of the numerous decisions of the courts, during the greater part of a century; but the basic principles of the system are not at all abstruse or difficult of comprehension.

A special assessment may be defined as, "A compulsory contribution paid once and for all to defray the cost of a specific improvement to property, undertaken in the public interest, and levied by the government in proportion to the special benefits accruing to the property owner."[1]

[1] E. R. A. Seligman, *Quarterly Journal of Economics*, April, 1893.

The fact that such levies are sometimes made payable in instalments at different times, does not affect the substantial accuracy of this definition.

The general theory upon which special assessments are justified and enforced may be briefly stated thus: Municipal corporations are clothed with authority to make certain public improvements. These improvements are primarily made for the benefit of the community at large; but it will often occur that certain parts of the community, or certain persons, will necessarily be benefited by the improvement more than others. Thus the paving of a street is warranted by the fact that it is demanded by the interest of the public as a whole. But if A owns property lying directly on this street, and B's property is situated several blocks away from it, it is obvious that A will receive more direct benefit from the improvement than will B. It may even happen that B will receive no direct palpable benefit at all, while the value of the property of A may be very largely increased thereby. It is therefore just that A should pay a larger share of the cost of the work than B. To distribute that cost equitably in proportion to the benefits realized is quite impossible where the cost is met by general taxation, since the first principle of general taxation is that it must be levied equally and uniformly upon all. Some special system of taxation must be devised, the operation of which will distribute the cost in the ratio of the benefits conferred. To do this is the object and function of "special assessments." If A's property is benefited twice as much as B's, he may fairly be required to pay two dollars where B pays one. If B's property receives no special benefit from the improve-

ment, A may be required to pay the whole of the cost, provided he is benefited to that extent. This theory is very simple, and obviously just. But when we come to determine how the burden is to be divided between A and B, or between the great number of people whose benefits must be considered, the problem is far from simple. Its proper solution is the object of all the various laws and court decisions on the subject.

The courts have dealt with a great many cases through a long period of years, and the result has been to arrive at a code of principles which may be now considered pretty well defined and settled. They may be outlined as follows: —

First, the right of the government to levy and enforce special assessments within defined limits is thoroughly established.

Second, special assessments partake of the nature of taxes, but the law makes a broad distinction between ordinary taxes and special assessments.

"Taxes . . . are public burdens imposed generally upon the inhabitants of the whole state or upon some civil division thereof for governmental purposes, without reference to peculiar benefits to particular individuals or property. Assessments have reference to impositions for improvements which are especially beneficial to particular individuals or property, and which are imposed in proportion to the particular benefits supposed to be conferred. They are justified only because the improvements confer special benefits, and are just only when they are divided in proportion to such benefits."[1]

[1] Roosevelt Hospital *vs.* The Mayor of New York, 84 N. Y. 108, p. 112.

Thus special assessments, while a species of taxation, are to be "understood to mean, a special imposition levied to defray the expenses of a specific improvement upon those property owners to whom particular advantages accrue, and in the ratio of those advantages."[1] But, like ordinary taxes, they have their foundation in the taxing power of the government. They may be, and generally are, though not necessarily, levied and collected in the same way as other taxes. Like ordinary taxes they constitute a lien on the property assessed, taking precedence of all other claims, ordinary taxes alone excepted. Except that they are not levied equally and uniformly on all, they are subject to the same limitations as other taxes. They can be levied for public purposes only, and must be applied to the public welfare. They can be levied only by due process of law, and must conform to all the requirements prescribed in levying other taxation.

Third, special assessments can be levied only in exchange for special benefits conferred, and only to the extent of such benefits. Unless A is especially benefited by an improvement, he cannot be especially assessed for its cost, and if his property is benefited only to the extent of, say, five hundred dollars, he cannot be specially assessed for more than that sum, no matter what may be the actual cost.

Fourth, it seems not to be clearly established that the cost of an improvement must be divided among *all* who are benefited by the improvement. Public improvements are not warranted in law unless they are for the public

[1] "Special Assessments," by Victor Rosewater, Columbia College, 1893.

good, and if so, every member of the public must, in theory at least, be benefited more or less thereby. But the courts have not uniformly held that in such cases the cost may not all be assessed upon those who are particularly benefited, provided that the special benefits equal the amount assessed. The general trend of the decisions is, however, to the effect that assessments must be apportioned among all who are benefited, and in the ratio of those benefits.

Fifth, special assessments can be levied only by authority of the legislature, and in strict accordance with the statutes relating thereto; but the legislature may delegate its power to municipal corporations, subject to such limitations and regulations as it may prescribe. The authority thus granted, however, cannot be exceeded by the municipality, and all proceedings must conform strictly to the provisions of the statutes, any departure from the prescribed procedure invalidating the assessment.

Sixth, while the fundamental principles governing special assessments are well established, and compliance with them is insisted upon by the courts, great variety exists and is allowed in the method of their application, and the laws of the state and the ordinances of the corporation must be studied and followed in the case of each individual city.

Usually, the legislative acts authorizing special assessments are very explicit and set out in detail the method to be followed, and very little latitude for variation is allowed the municipal corporation, whose officers are therefore only called upon to comply as closely as possible with the line of procedure thus laid down.

Legislative enactments, however, while purporting to be of a general character, are often drawn so that they really apply to but one or two municipal corporations in the state, and are framed to meet the actual or supposed conditions and needs of those corporations, and their provisions are often suggested or dictated by the local corporation authorities. It is therefore desirable that city officials and citizens should be familiar with the subject to which such legislation relates. While it would be quite impossible to go into all the details of the application of special assessments to the several kinds of municipal work, it will not be amiss to look into the matter in a general way, with the view of establishing correct conceptions on the subject.

While special assessments must be levied in the ratio of benefits conferred, there exists great latitude in the methods employed for accomplishing the proper distribution of the cost of an improvement among those benefited. Schemes of assessment that prove satisfactory for one kind of improvement may be entirely unsuitable for another, and the local conditions in one city may be so different from those in another that the same method may not be applicable to work of the same general character in each.

One of the most common applications of special assessment is to provide means for the construction of street pavements. It is especially appropriate for this kind of improvement, because in no other is the fact of special benefit so obvious and so easily demonstrated. The construction of a good pavement in front of city property hardly ever fails greatly to enhance the value of that property, while, except in so far as it benefits the public

at large, it does not materially increase the value of property not contiguous to the street paved. The increase in the value of the abutting property is usually so great and so immediate that the cost of the work is willingly met by the owners of the property thus benefited. Moreover, the demand for good pavements in every city is so insistent, and the cost so great in the aggregate, that the community is not willing to wait until they can be provided and paid for out of the ordinary revenues of the corporation. Special assessments, particularly where they are paid in instalments extending over a period of years, offer a ready and acceptable solution of the problem, without greatly increasing the burden of general taxation.

While the lawful application of special assessments to the meeting of the cost of street-paving is more simple than to any other class of work, it is not without its difficulties and perplexities, particularly in view of the more recent decisions of the courts, enforcing very literally the condition that assessments must be strictly in accordance with benefits.

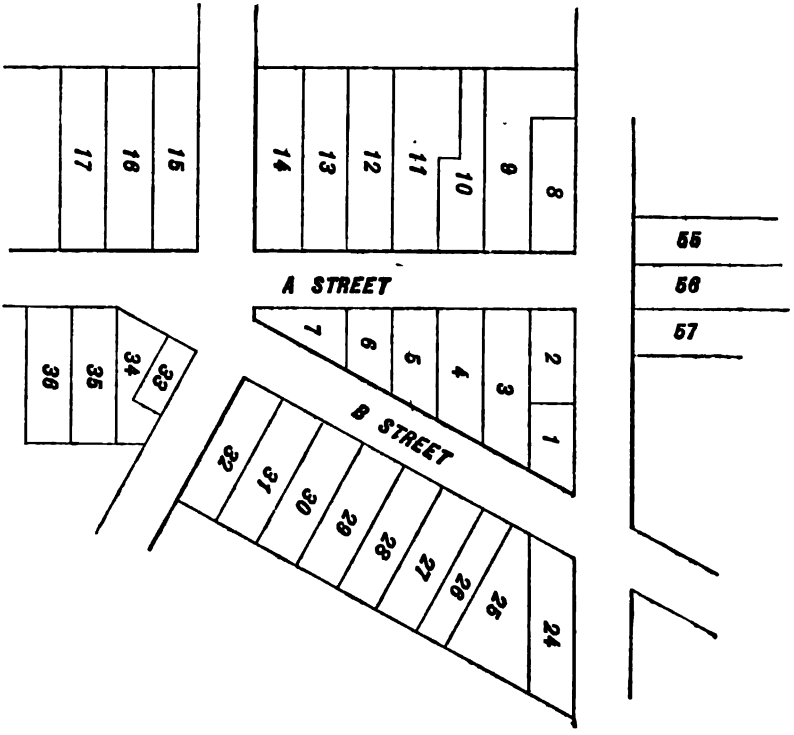
The first question that arises in considering a scheme of special assessments for street-paving is that relating to the relative parts of the cost that should be paid by the public at large and by the owners of property abutting on the street. The more common practice is to consider that the abutting property is alone specially benefited, and must therefore bear the whole cost of the improvement. This assumption is particularly attractive because it relieves the municipality from paying any part of the cost of the improvement, and greatly simplifies the levying and collecting of the assessments. But

the assumption that the abutting property is alone specially benefited by the paving of a street is nearly always wrong in both theory and practice. The public must necessarily be more or less benefited by the improvement in nearly every case. This fact is recognized in a large number of cities, and some provision is made for paying a part of the cost from the general funds. A quite common practice is for the municipality to pay the cost of paving the street intersections, the balance being distributed among the abutting property owners. In other cities some definite part, varying from one-fiftieth to one-half of the whole cost, is paid by the municipality. In others the cost of the intersections and some aliquot part of the whole of the remaining cost is met by the municipality. In still others the municipality pays for the grading of the street, and assesses the cost of the pavement proper upon the abutting property. These methods are simple, but a little consideration will show that when applied uniformly to all streets they are wrong in theory and generally wrong in practice, for the reason that the relative benefits accruing to the general public and to the abutting property owners are scarcely ever the same on different streets, or on different parts of the same street. In the case of central business streets, largely used by the public, the general benefit to the public may be much greater than the special benefit to the owners of the abutting property; while in the case of suburban or residence streets, not much used as public highways, the benefit may be almost wholly to the property owners along the street. Between these two extremes there must exist different ratios of benefit to the public and to

the property owners on each different street. It would seem, therefore, that if the underlying principle of special assessments is to be strictly adhered to, there can be no hard and fast rule adopted and applied to all streets alike. When it comes to distributing among them the part to be paid by the abutting property owners on any one street, the almost universal practice is to divide the whole amount assessed in the ratio that the number of abutting front feet of each property owner bears to the whole number of front feet of property abutting on the street. This is known as "the front foot" method. It is the simplest possible method, but its simplicity is about the only argument in its favor. It may, and perhaps generally does, occur that each property owner on the street is benefited by the improvement in the ratio of his property fronting on the street; but the exceptions are so many and the injustice of the rule is often so palpable as to make it a very dangerous procedure in view of the enforcement by the courts of the principle that assessments must be in the ratio of special benefits conferred. Every city official who has had experience in levying special assessments by this method will recall one or more cases where its operation brought about injustice to some of the property assessed, and therefore violated the spirit, if not the letter, of the law. Some common examples may not be uninteresting. The plat on the next page is an imaginary one, but all the anomalous features it contains, and many others, are actually met with in city maps. It is proposed to pave streets A and B, and to assess the cost of the work upon the abutting property by the front-foot method. A glance at the plat will show the difficulties

that will be encountered. We need not consider the question of how to assess the corner lots, as it has been quite fully discussed.

To assess lots 9, 10, and 11 equally would be at least open to criticism, since their value for business purposes,



and the benefit to each, cannot be equal. Lots 17 and 85 have the same frontage, but the former is 200 feet deep, while the latter is but 150 feet deep. Their value for business purposes is presumably in the

ratio of their area, and, if so, one must be benefited more than the other. Lots 33, 34, and 35 are so different from each other that the benefit they would receive cannot be measured by the extent of their frontage on the street. Lots 24 and 25 present the same anomalous conditions. Lot 4 and lot 28 are of the same actual width, but their frontage is different because lot 4 does not lie perpendicular to the street. Lots 3, 4, 5, 6, and 7 obviously cannot be assessed for the same sum, even if street A were alone paved; but since street B is to be paved also, each lot must, by the front-foot method, be doubly assessed. Furthermore, in this case the benefit is not confined to the lots abutting on the streets, since lots 55 and 56 will obviously be benefited by the pavement of street A. Where the streets are curved, as in some cities, still further irregularities will exist.

If, as is often the case, the grade of the street is changed, it will introduce other discrepancies in the benefits conferred by the improvement, and even if the grades are not changed at the time, it may be questioned whether the relation between the surface of the lots and the surface of the street should not be considered. It can hardly be said that the owner of a lot that must be filled up ten feet before it can be built upon, is as much benefited by the paving of the street as is the owner of a lot that requires no such grading.

It will at once occur to the reader that the *area* of these several lots is an important element in determining the fair share they should bear of the cost of the improvement. It has been proposed to make area, as well as frontage, an element in levying special assessments, by

assuming that a certain percentage of the whole cost to be assessed shall be levied by the front-foot method, and the remainder shall be distributed in the ratio of the areas of the several lots. This plan is used in a few cities in apportioning assessments for sewers; but so far as the writer knows, it has not been applied in the case of pavements.

In one city, Seattle, Washington, the property fronting on the street is divided into belts or zones, parallel to the street, and the cost is assessed on the property in a stated ratio to its area lying within those zones. Forty per cent is assessed against property lying within the first zone, thirty feet wide, adjoining the street, twenty-five per cent on property in the zone between thirty and sixty feet from the street, twenty per cent on the zone bounded by lines sixty and ninety feet from the street, and fifteen per cent on the property lying in the rear of the line ninety feet from the street, this zone extending to the central line between two parallel streets, and varying in width according to the depth of the blocks. This plan has much in its favor, eliminating as it does some of the difficulties of the front-foot system; but it does not wholly remedy the glaring defects of that plan.

When it comes to specially assessing the cost of sewer improvements, the conditions differ from those of street-paving, and a different system is generally necessary, though in a number of cities the cost is distributed on the front-foot plan with certain modifications. In constructing a sewer system the cost is not uniformly distributed along the streets in the area drained. Beginning at the outer margin of a sewerage district, the size and cost

of the sewers must necessarily increase to the final outlet, and it would be obviously unfair to assess each street with the cost of sewers lying in front of and serving the property on that street. The sewerage provided serves the wants of all property in the district equally, and the object should be to distribute the cost on some equitable plan over the property of the whole district. Among the methods in most common use, that of assessing each lot in the ratio that the area of that lot bears to the area of the whole sewerage district, seems most equitable. Assuming that the whole district is built up, this plan is reasonable, since it may be roughly assumed that the quantity of sewage to be cared for from each lot is in the ratio of the area of the lot. This is more nearly true where the sewers are designed to take care of the storm water as well as the sewage proper. The owners of unimproved property very naturally object to being required to pay for sewers which they do not at present need; but a proper reply to them is that a sewerage system is a permanent improvement, the utility of which will extend over a long period of time, and which cannot usually be built in parts as it may be needed; and that the construction of sewers in unimproved property makes such property more available for improvement, and thus enhances its value. A number of cities have adopted the method of assessing a stated percentage of the cost by the front-foot plan, and the balance upon the area plan; and various other schemes are in use.

In the construction of sewers the relative benefit to the public at large as compared with the individual property

owner is greater than in the paving of streets. The existence or absence of sewers may very materially affect the sanitary conditions of the whole city, and this is true whether the sewers are for the service of the whole city or for only a part of it, as a single sewerage district. It is quite proper, therefore, that a part of their cost should be met from the public funds, and this is usually provided for in some way; but no satisfactory basis for determining how much of the cost shall be borne by the public, and how much shall be assessed upon the individuals or the district specially benefited, has been devised. In some cities a certain aliquot part of the whole cost is paid from the general fund; in others, the larger or trunk sewers are paid for by the city, and the cost of the smaller ones is assessed upon property holders; but the conditions vary so greatly in the different cities, and in the different parts of the same city, that no inflexible rule can be justly applied to all. Some few cities have adopted the plan of constructing sewers at the expense of the general fund, and charging individual property owners a stipulated rental for each connection, and much may be said in favor of this practice where the rentals are properly adjusted. In the great majority of the cities, the house connections are put in at the expense of the individual owners.

Special assessments are also resorted to in a number of cities to provide a part of the cost of constructing water works, but the conditions are more complicated than in the case of either pavements or sewers, although where special benefits clearly accrue to one or more property owners from water-works improvements, it is

entirely just that they should be specially assessed for a part of the cost.

What has been said is sufficient to show that, granting the legality and justness of special assessments, the great difficulty that constantly presents itself in their practical application, is so to apportion the amount levied on each individual in the ratio of the benefits received by him as to meet the very strict requirements of the general law as it is now interpreted by the highest courts. While cases of slight injustice to individuals may be overlooked by the courts, where the effort properly to apportion the levy in accordance with the law is apparent, any considerable departure from the principles laid down will render the whole levy illegal and void. It becomes, therefore, a matter of the very greatest importance to municipal corporations, not only that any system of special assessments adopted shall be workable in accordance with the legal requirements, but that great care shall be taken to follow implicitly the line of procedure which the law prescribes.

In framing special assessment laws it would seem very unwise to lay down inflexible rules or details which may not be applicable to varying conditions as they may arise, and which do not permit such elasticity as will allow these unusual and varying conditions to be met and provided for in a just and rational manner. It would seem that the only way in which this can be done is to delegate to some competent and disinterested person or persons the power and authority to make the distribution of cost among all the parties benefited, after a full consideration of all the facts. In this way the intent of the law could be carried out with judgment and intelligence. The

law of the state of New York relating to special assessments in the city of New York is framed upon this idea, and as its provisions seem to come nearer to the ideal plan of dealing with the subject, its leading provisions will be here outlined. The new charter for "Greater New York," adopted in 1897, made some changes in the provisions that were in force previous to that time, but they are not very material.

Under the new charter special assessments belong to the "Department of Taxes and Assessments." Under this general department there is appointed by the mayor a permanent "Board of Assessors," consisting of five persons. This board is authorized to appoint a secretary and such subordinates as may be necessary. "The said board shall be charged with the duty of making all assessments, other than those required by law to be confirmed by a Court of Record for local improvements, for which assessments may be legally imposed in any part of the city of New York as hereby constituted."[1]

There is also created the "Board of Revision of Assessments," composed of the Comptroller, the Corporation Counsel, and the president of the Board of Public Improvements, which board has power to revise, correct, and confirm all assessments not confirmed by the Board of Assessors. "Said board shall have power to consider, on the merits, all objections made to any such assessment, and to subpœna and examine witnesses in relation thereto, and to confirm said assessment, or to refer the same back to the Board of Assessors for revisal and correction in such respects as it may determine."

[1] Sec. 943, Chap. 378, Acts 1897.

Local improvements are initiated and carried out as provided for in the charter, and the authority which determines that such improvement shall be made has power to determine whether any, and if any, what proportion of the cost or expense of the improvement shall be borne and paid by the city, and the remainder of the cost and expense thereof shall be assessed upon the property deemed to be benefited thereby. The work of such improvements is carried out by contract and paid for from the city funds pending the collection of the special assessments.

When any public work which is to be paid for wholly or partly by special assessments has been completed, the officer, or head of department charged with the execution of the work, certifies to the Board of Assessors the total amount of all the expenses which shall have been actually incurred by the city on account thereof. The City Comptroller also certifies to the Board of Assessors the amount of interest, at the legal rate, upon all the money that may have been paid out for the work, from the time of payment to a date sixty days after the date of such certificate. The Board of Assessors then proceeds to assess upon the property benefited, in the manner authorized by law, the aggregate amount of such certificates, or such proportion thereof as is authorized by law; but the amount assessed against any property may not exceed one-half the fair value thereof.

The Board of Assessors, when it has completed the assessment, must publish a notice of the fact. This notice must describe the limits within which it is proposed to lay the proposed assessment, and must request all persons who may be affected thereby, and who may be

opposed to the same, to present their objections in writing to the secretary of the board within thirty days of the date of the notice, and it must specify a time and place when and where, after the expiration of thirty days, such objections will be heard, and testimony received. If no objections shall be received, or if the assessment shall be altered so as to remove the objections, the board at once declares the assessment confirmed, and transmits the same to the Comptroller for entry and collection. If, however, the board shall not alter an assessment to which objections have been made, or if objections still exist after it is altered, it is their duty to present the proposed assessment, with the objections thereto, to the Board of Revision of Assessments, who, after hearing evidence and considering the matter, may either confirm the assessment or refer it back to the Board of Assessors for revisal and correction in such respects as it may determine. If confirmed, it is sent to the Comptroller, but if not confirmed, or if not referred back for revision within thirty days after presentation, it shall be deemed confirmed.

Damages for changes of grade may be allowed by the Board of Assessors, under certain conditions, and any damage allowed shall be included in the cost of the improvement and the assessment therefor.

After the confirmation of the assessment any property owner who may allege that fraud or substantial error has been committed in the assessment, may bring his case before a justice of the Supreme Court, who, after hearing, may modify the assessment; but it is specifically provided that no technicality or informality or irregularity in the proceedings leading to the assessment shall invalidate

such assessment. It is distinctly declared that "All property in said city benefited by any improvement or other public work . . . shall be liable to assessment for such improvement or work." No assessment can be vacated by the court, but it may be reduced to the extent that it may be shown to have been increased by fraud or substantial error, and in no event shall the property be relieved from assessment of its fair proportion of the fair cost of any local improvement. The amount so specially assessed against any property becomes a lien on the property, and is collected in the same manner as are ordinary taxes. The property of the city, as well as private property, is subject to special assessments.

The provisions of this law which are most worthy of note are, first, that it provides a special board or body of men who are authorized to deal with the whole subject of apportioning special assessments; second, that beyond restrictions which are general in their character, this board has full and unrestricted authority to exercise its judgment in apportioning the cost of any improvement among those benefited in the ratio of such benefits; and, third, that ample provision is made for hearing, considering, and deciding the objections of any property owner who may feel himself aggrieved by the assessment made. It seems, therefore, to fill all the conditions requisite in such a law, and at the same time it admits of such elasticity and flexibility in details as to avoid the difficulties that are met with in the practical application of the more rigid laws found in many states. While its details may be varied, the principles which it represents are applicable to all localities.

CHAPTER XIII

MUNICIPAL ACCOUNTS AND UNIFORM ACCOUNTING

BRIEF reference was made in Chapter X to the importance of uniform municipal accounting in order that the results of the construction and operation of municipal works in one city may be intelligently compared with those in other cities. The whole matter of municipal accounting is so intimately connected with the proper administration of the public works of a city that the subject may be appropriate for consideration in this book. It is not too much to say that few subjects now occupying the attention of municipal officers and students of municipal government are of more practical importance than that of municipal bookkeeping and accounts. It is a subject that until recent years has received comparatively little attention.

It is asserted by those who have looked into the subject that, with very few exceptions, the accounting systems and practices of our cities and towns are imperfect, inadequate, and antiquated to a degree that would not be tolerated for a moment in a modern private business corporation or firm. It is often, if not generally, difficult to obtain from the published reports and statements, or from the books, reliable information as to the actual finances of the city, and much more difficult to determine with accuracy and in satisfactory detail the cost of its

various public works and services. In many cases this is doubtless due to the fact that the systems and forms used were adopted when the cities were much smaller, and before the growth and complexity of the corporation business rendered more accurate methods necessary, and they have not been since changed to meet the new conditions.

There will be found a wide difference between the accounting of cities, and that of a model business corporation, where not only the financial condition of the corporation is distinctly and accurately disclosed, but the cost of every part of its business or work is accurately determined down to minute details, and in such form as to be readily accessible at any time to the management. The science of account keeping has made great advancement in the hands of these business corporations, and their methods might be studied to great advantage by municipal accountants. It would probably be found that, notwithstanding their completeness and accuracy, they are much less cumbersome than old-fashioned methods, and that they are also less expensive. But whether more or less expensive, the importance of complete and accurate accounts justifies the expenditure of any reasonable amount of money necessary to secure them. No fact is better recognized in the modern business world than that such accounts are a necessity, whatever they may cost.

If the manufacturer is told by his bookkeeper that the total cost of making a given article is a stated sum, he will add his percentage of profit and fix the selling price accordingly. If the accounts upon which he relies are erroneous or misleading, and the cost of manufacturing is greater than was represented, he may find himself

on the road to bankruptcy rather than to prosperity. He therefore cannot afford to have any mistake or uncertainty in his accounting department. This should be no less true with municipal corporations. And yet, if credible witnesses are to be believed, it would be a very difficult thing to obtain the true cost of public work and public service from the books or reports of most cities. Thus, it has been conclusively proved by expert examination that reports of the cost of electric lighting, where the lighting plant is owned by the city, have been grossly erroneous, and both citizens and city officials have been led into the belief that the service has been phenomenally economical, when as a matter of fact it has been excessively expensive. It is hardly supposable that these misleading accounts are purposely distorted in order to deceive, and they can only be explained upon the hypothesis that the bookkeeping is defective and wholly unreliable.

An account that gives but part of the information it is intended to and should convey, may be, and usually is, worse than useless. In accounts and statistics, more than in some other departments of knowledge, "a little knowledge is a dangerous thing" upon which to base conclusions. Thus a taxpayer of Minneapolis, knowing the bare fact that the city tax rate in that city is $14.90 per thousand dollars of assessed valuation, may justly feel indignant with his home government when he learns that in Providence, Rhode Island, a city of about the same size, the city tax rate is but $9.70 per one thousand dollars of assessed valuation; but when he learns that his own property is assessed upon but sixty per cent of its actual value, while that of the Providence taxpayer is

assessed at its full value, he may readily figure that he is actually paying less city tax for each one thousand dollars' worth of property than is the citizen of Providence, and his indignation is likely to disappear.

An account that deludes the officials or the citizens of a city into the belief that under municipal ownership or control the public water supply or the public lighting is costing the municipal corporation very much less than the same service could be secured by contract from private corporations, is not only useless but positively injurious and against public policy. It may almost be called criminal. And yet, if we are to believe competent and often undisputed testimony, such deceptive accounts are the rule rather than the exception. A few examples will serve to illustrate: Some years ago the city of Detroit, believing that it would be more economical to supply its own public lighting, constructed and operated its own electric lighting plant. The published reports and statements seemed to justify the expectations of economy, as they showed that the actual cost to the city for each light furnished was very much less than the lowest bid previously received from private lighting companies. The results attracted wide attention, and challenged investigation by those interested in municipal lighting, and such investigation disclosed the true condition of affairs, which was, that as a matter of fact it was costing to light the city more, rather than less, than it would have cost had the proposition of the lowest bidder been accepted.[1] In 1898 the committee on

[1] See report of Samuel Unsell on cost of electric lighting in Detroit, published in *The Economist*, Chicago, April 8, 15, and 22, 1899.

lighting the streets of Springfield, Massachusetts, submitted a report from which I quote the following : —

"The committee on lighting streets, who were directed to investigate and report on municipal lighting, respectfully submit the accompanying report, after a most careful and thorough investigation. To aid us in our investigation your committee sent out a list of questions to cities employing the municipal plan, and to cities buying their lights from private corporations. Out of fifty circulars sent to cities contracting from private corporations, we received thirty-four replies, which were tabulated as shown by attached table. Out of the same number of circulars sent to cities using a municipal plant, only eleven replies were received, and the answers were so indefinite that a more concise list of questions were sent out, and to a second circular we received seventeen replies. These were tabulated in the same manner as those from cities with private plants, and the copy is attached. We found the answers received from municipal plants very unsatisfactory, and we must say, in some cases, inaccurate, as the answers received from one city were very different on the two circulars sent, and we are advised that on four requests for information similar to our own no two were alike. This arises principally from the way in which cost is figured, but the result is very unsatisfactory and misleading."

No better evidence than this report affords could be adduced to prove the utter worthlessness and deceptiveness of systems and methods of bookkeeping that make possible such misleading statements in important enterprises.

Now, it may be said, without any reference to the question whether or not municipal ownership and operation is desirable, that the taxpayers of a city are entitled to know the exact facts, in order that they may judge of the results obtained and take such action as those results may seem to demand. This knowledge can only be secured and made public through the adoption and use of such a system of account keeping as is to be found in the office of every enterprising business man or business corporation.

While it is hardly conceivable that the accounts of a municipality would be intentionally distorted for fraudulent purposes by dishonest city officials, since the act is too easily detected by expert examination which may be called for at any moment, it is nevertheless true that careless and imperfect accounts, which do not reveal the whole truth, may not only be used to create wrong impressions of a city's financial condition, but they may be so manipulated, by designing persons, without laying themselves open to the charge of actual fraud, as to conceal from the ordinary citizen conditions which would, if made public, at once convict the city government of gross mismanagement, if nothing worse. In this view of the matter it will be apparent that there is a close relation between good municipal accounting and good municipal government; for in order that city officials may be held strictly responsible for their trust, it is essential that the public shall know accurately and fully how they are discharging that trust, and this will be impossible if the accounts kept and the reports rendered do not show the exact condition of the city's finances and the actual cost of administration in the several departments of business which the city undertakes.

The ideal system of accounts for a municipal corporation is one that records and exhibits the actual condition of the finances of the corporation with such completeness and in such detail that not only may each cent of revenue be traced from its source to its ultimate expenditure, and the results achieved with it disclosed, but also the total and unit cost of the work or service upon which it may be expended.

The salary paid to the average accounting officer of our cities will seldom secure the knowledge, skill, and experience necessary to devise, open, and maintain an ideal system of accounts, and it will often be necessary to secure the temporary aid of expert accountants familiar with municipal business. It is nearly always desirable to have their assistance in opening a set of books, and the money paid for their services will usually be well invested.

There seems to be a growing tendency at this time to concentrate the departments of finance and accounts in the hands of one person of high character and ability, usually called the comptroller, and to clothe him with rather extraordinary power, which is little short of autocratic. He may review the actions of other city officials, and may surround himself with experts who sit in judgment on the acts of his associates in the municipal government. In the prosecution of public work, for instance, he may assume to decide whether the work has been done in accordance with contracts and specifications, and if, in his opinion, it has not, may withhold payment for the same indefinitely. He may assume virtually to veto the acts and policies of the heads of other departments by withholding or threatening to withhold payments that are or

would be necessary. Such extraordinary power may sometimes serve a useful purpose, but it is certainly contrary to the true principle of government which dictates that heads of departments shall be individually held responsible for their actions to the appointing power alone, whether it be the mayor, the council, or other authority. The comptroller may and should, of course, take appropriate and prompt action where he has reason to believe that extravagance, error, or fraud exists; but where questions of policy or of administration are alone involved, he should not be allowed to interfere. It is absurd, for instance, to permit him to exercise his judgment in technical matters about which he is supposed to know little or nothing, or to interpret engineering specifications, and decide whether or not they have been complied with. Such functions belong to the properly constituted technical authorities and the engineering department, who may and should be held strictly accountable. Even if the comptroller is fully competent to deal with such matters, interference is quite sure to give rise to differences and antagonisms which not only cripple the efficiency of the departments, but often tend needlessly to weaken the confidence of the public in its duly constituted authorities. When it is remembered that the comptroller, particularly if elected by the council (as proposed in "A Municipal Program"[1]), is as likely to be fallible as the head of any other department, and may, besides, lack the special qualifications, even with the assistance of his

[1] "A Municipal Program," Report of a committee of The National Municipal League, adopted by the League, November 17, 1899, together with explanatory and other papers. 1900.

experts, that are supposed to be essential in those heads of departments, it seems not only unnecessary but very unwise to clothe this officer with greater power than legitimately belongs to his office.

By the term "uniform municipal accounts" is meant the general adoption by municipal corporations of a common system of accounting in which uniform principles and methods shall govern, both as to the heads of accounts and the particular items that shall be charged to each. Incidentally it contemplates the adoption and use of accurate and approved accounting by each individual city, since, to be of value for purposes of comparison, the information disclosed must be complete and accurate, as well as that it must conform to a uniform system. The object sought to be attained is not only to give the officers and taxpayers of any city a correct and adequate knowledge of the affairs of the corporation, but to enable them, as well as others, to judge of the efficiency and economy with which the corporation business is transacted, as compared with other municipal corporations. Unless the accounts of two cities are made up on the same basis, embracing the same elements and details, no intelligent comparison, one with the other, can be made. Illustrations of this fact are common in attempting to compare the cost of pavements and other work in various cities. One city may report the average cost of asphalt pavements at $1.80 per square yard, while another may report it as costing $2.40 per square yard. This seems a wide and unaccountable difference until it is learned that in one city the price covers only the asphalt surface proper, the excavation, rolling, and concrete foundation being

paid for as separate items, while in the other the price includes these items. This lack of uniformity and completeness will be encountered in almost every department of municipal work in attempting to compare the results in one city with those in another. When one city reports that the cost of street cleaning has been a stated price per mile of street or per capita of population, and another reports the cost as fifty per cent greater for service presumed to be identical, we are justified in concluding that the difference is one largely of accounting, rather than of management, but we cannot feel certain of this until we know whether both accounts are made up on the same basis and embrace the same items.

Comparison of the cost of any work or service in one city with that of the same work or service in other cities, making due allowance for differing conditions, is the only practicable test of the relative economy with which the business of any city is conducted, and consequently it is obviously of great importance that reports of such cost should be upon some uniform basis, so that results may be comparable. Differing conditions and varying cost of materials in different cities will always cause the cost of similar work in them to differ more or less, but with full explanation of the conditions, and records of cost of supplies, extravagance or mismanagement in any city might be more easily and quickly detected, and checks and remedies provided, than is possible now. It is probable that no such wide differences in cost of work and service as the reports we often see seem to indicate, actually occur, and that the charges of recklessness and extravagance so often heard against city officials

may be traced to bookkeeping methods rather than to mismanagement or to more serious dereliction.

The present active movement in favor of uniform accounting is largely due to the efforts of the associations of municipal officers and the various technical societies in this country, the members of which have long felt the necessity for, and understood the value of, intelligent comparison of cost of work and service, one city with another. Most of these organizations have appointed committees to assist in promoting accurate and uniform accounting, and their efforts are already meeting with a degree of success that is very promising. Some of the associations whose work is confined to a special field have already secured the adoption of uniform schedules of accounts and reports relating to their special departments. Thus the New England Water Works Association has brought about the adoption of a complete uniform schedule in reporting the accounts and statistics of water works under the control of its members. The National Electric Light Association is engaged in a similar effort. The city of Newton, Massachusetts, has recently adopted a provisional schedule of accounts in line with the most advanced ideas upon the subject, and the Department of Statistics of the City of Boston is making an effort to apply like methods to the accounts of that city. It is hardly consistent with the plan of this book to go at length into these details concerning what is being done, as this information can be found in the reports of the various associations and in the various periodicals dealing with such matters. Our present object is to deal rather with the principles involved.

H. S. Chase

As before remarked, the general use of uniform accounts and reports must go hand in hand with correct bookkeeping and the adoption and use of the necessary schedules and forms by the individual cities. At present, in most of the states, this can be accomplished only by the voluntary action of the individual cities, and there is reason to fear that the process will be a slow one, as it seems difficult to arouse an active interest in the matter in many city governments. The desired end could be attained much more rapidly and certainly by legislative action on the part of each state. A considerable number of the states now require the submission to some state official by the private or semi-private corporations, of reports of their business, upon a prescribed uniform schedule, and the same principle might be applied to the municipal corporations. This has, in fact, been attempted in one or two states already with promising results.

In a general way statutes of this character should provide: —

First, that some officer or department of the state shall be designated to receive and audit the accounts of all municipal corporations chartered by the state.

Second, that said officer or department shall have power to prepare and to require the use of a suitable system of bookkeeping for municipal corporations, and to prescribe forms and schedules of reports to be made by each such corporation at designated times, these reports to be attested under oath by the accounting department of the corporation.

Third, the state officer or department shall be empowered and directed to examine the books and audit the

accounts and reports of each corporation, and shall certify to their correctness.

Fourth, these reports shall be published by the state annually.

Fifth, suitable penalties shall be prescribed and enforced to compel the municipal corporations to comply with the requirements of the law.

There can be no valid objection to the enactment and enforcement of such a state law. The utility of the reports rendered would, of course, depend upon the completeness and detail of the schedules and instructions prescribed by the state, and these should be prepared with great care in conformity with the best theory and practice.

It is not unlikely that experience would disclose defects in any system first adopted, but it could be modified from time to time as necessity or expediency might make changes advisable. Such legislation by the several states would undoubtedly bring about the desired results most effectually and in the shortest time, in each individual state. But any measure of this kind would fall short of what is needed if it did not also secure the same degree of uniformity in the requirements of the several states. Since, under our form of government, legislation of this character is reserved to the states alone, we must depend upon securing such uniformity in state laws as will render the system effective and satisfactory. This can be best brought about through the agency and influence of the technical and economic societies and associations, aided by the efforts of individuals interested in the matter. It is therefore desirable

and important that the work of these organizations should be encouraged and supported in every practicable way, and that they should be seconded by every municipal officer and every friend of good municipal government.

CHAPTER XIV

MUNICIPAL OWNERSHIP

No question relating to city government or municipal economics has in recent years been discussed with more interest and zeal on both sides than that of whether it is best for municipal corporations to own outright and operate plants for supplying public utilities. So great has often been the zeal of those who have been engaged in this discussion, whether on the one side or on the other, and so exaggerated have been the statements and claims made, that the careful student is often bewildered and confused as to the real facts and the sober arguments upon the basis of which the question must in the end be answered.

Without attempting to go into minor details, and without considering the statistics so freely flung about, regardless of their verity or value, let us attempt to consider the principles involved and the admitted facts available, with the view, not of deciding the question, but of learning what appears, at this time, the most rational conclusion. It is a question that must, in the end, be answered by established facts and sound business judgment. To becloud the real issues by irrelevant and exaggerated discussion is only to retard actual progress toward a final solution. Neither utopian schemes of reform, extravagant predictions based upon theories of the

perfect municipal government, wild estimates of economies attainable, or charges of rapacity and corruption against present corporations, on the one hand; nor claims of vested rights, unfair treatment, or violated functions of government, on the other, can have very much weight in enabling us to reach a final conclusion. If in the end it shall appear that the interests of the citizen may be best served, and the greatest good to the greatest number secured by municipal ownership and operation of public utilities, that plan will prevail, regardless of minor considerations or of personal interests.

The principal claim, and obviously the most important one, advanced by those who favor municipal ownership, is that better and cheaper service can be given to the citizen and taxpayer under this system than under a system of private ownership. Into the consideration of this main question several elements enter which may be stated as follows: —

First: Considered simply as an elementary question, there are no inherent or latent reasons why service under the one system may not be as good and as economical as service under the other. All other things being equal, a pound of coal will not yield more units of heat, those units of heat will not convert more water into steam, that steam cannot be transformed into more power, and that power cannot be made to render more service, under one ownership than under another. This is a self-evident proposition, which it would seem unnecessary to state were it not for the fact that some enthusiastic debaters seem to ignore, and statistics, often quoted, seem to belie it. Assuming its truth, it follows that, speaking gener-

ally, any difference in the amount or quality of service secured by the expenditure of a dollar in one case as compared with another must be accounted for by a difference in knowledge or skill, or in economy in the management of those in charge of such expenditure. Nor is there any inherent reason why one man or corporation may not possess, or be able to secure, the necessary knowledge, skill, and economy as well as another. Neither a private nor a municipal corporation may or can have a monopoly of brains. Essentially, then, the problem of first cost is one of skilful and efficient management, and the practical question becomes: Are there any reasons why a public utility plant cannot be managed as well and as economically by a municipal as by a private corporation?

Second: The advocates of municipal ownership assert that, the market for knowledge and skill being open to all, the municipality has the same opportunity to secure the best executive ability and technical skill, and the most efficient labor, as has the private corporation; that, in fact, its opportunity is rather better, because, as a rule, the municipal corporation pays higher wages and requires shorter hours, and because the employee of the city will consider his wages less liable to default, and his position more secure, than will the employee of a private corporation, and for these reasons he is likely to be more interested in his work, and to labor with more zeal than he otherwise would. The advocates of private ownership, on the contrary, assert, to begin with, that while it is true that the municipality is free to secure its talent and labor in the open market, its executives are not, as a rule, as capable of judging

of the capacity and skill of the men required to manage a special business as are the private managers of similar enterprises, who have usually acquired, through long experience, a knowledge of the special qualifications required to operate that particular kind of business. When it is considered that the average city official, if not a professional man or politician, is chosen from the ranks of men engaged in ordinary business, and, however able he may be in his own province, is likely to be deficient in the knowledge of and training for the special business with which he is called upon to deal, it must be admitted that the point seems well taken. It is pointed out, also, that the short tenure of office common in city governments often results in the displacement of studious and able officials about as soon as they have had time to acquire an expert knowledge of any public business which they may be called upon to manage.

It is argued, further, that everyday experience proves that laborers and other employees of a municipal corporation do not work as hard or as efficiently as those of private employers, and that increasing the pay and shortening the hours of employees almost invariably increases the cost of production in any business, particularly if the men have not been overworked or underpaid before the making of the change. It is therefore asserted that under municipal ownership the efficiency of the management from the top to the bottom of the scale of employees is nearly always inferior to that in private corporations. It is also asserted that as a rule materials and supplies of a given quality can be purchased more economically by a private than by a municipal corporation; that, even if

political influence and private jobbery be eliminated, the purchase of supplies by the municipality is hedged about by so many requirements and so much "red tape" that advantage cannot be taken of fluctuations in the market, commercial exigencies, and favorable conditions, as they may be by the private owner. In regard to this it may be remarked that while, theoretically, there is no sound reason why a municipality should not be able to purchase its materials and supplies at as low a price and of as good a quality as can a private corporation, experience seems to prove that as a rule it does not do so. So far as first cost of production is concerned, the private corporation seems, upon the whole, to have the advantage.

It is not, however, first cost of production, but the cost of the finished article or service when delivered to the consumer, that is to be considered. The private owner conducts the business for profit, and that profit must be added to first cost in fixing the price of the commodity to the municipality. The municipality, on the other hand, expects no profit, its sole object being to supply the commodity or the service to its citizens at the lowest possible price. Unless, therefore, the profit demanded be less than the difference in first cost between the private and the municipal producer, the product should be delivered to the consumers at a less cost under municipal than under private control. The question of the profit demanded by the private corporation therefore becomes a most important one in dealing with the problem. It is, in fact, the principal bone of contention in the controversy.

It is admitted on all hands that the private owner is entitled to a reasonable profit on the cost of production.

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It is contended, however, by the advocates of municipal ownership, that the private corporations demand and manage to extort an unreasonable and unusual profit. If the question could be narrowed down to the one of what is a fair percentage of profit upon the exact cost of production, it would be greatly simplified. But the public does not usually know and cannot obtain the true first cost, and partly, at least, because the owners refuse to divulge the facts and submit them to verification, people conclude that these facts are withheld because they would disclose unreasonable profits. It is asserted and believed that the private corporations inflate their capital stock to make the dividends declared appear reasonable; that many such stocks are thus "watered" to such an extent that the total capitalization is from two to five or more times the money actually invested, so that a five per cent dividend on the capital stock would mean from ten to fifty or more per cent upon the actual investment. There are abundant facts to establish the truth of these assertions in many cases, and good reason to believe that inflation of capital, in whatever way it may be accomplished, is resorted to in most cases. On the other hand, people are quite likely to underestimate the amount of capital legitimately invested, as well as the operating expenses of such a corporation, and so to place the amount of reasonable profit at too low a figure. Both causes operate to convince the public that the profits demanded and received are exorbitant, and the prices at which service is supplied are unnecessarily and unreasonably high. There is thus a wide difference upon this point between the statements of the private owners and the belief of the

advocates of municipal ownership. It is probably true that the cost of production is much greater than is popularly believed, but on the whole the advocates of municipal ownership seem to have the better of the argument in this branch of the subject.

In regard to the rate of profit that may reasonably be demanded, it will hardly be contended that it should not be greater than the prevailing rate of interest. The market rate of interest is, practically, based upon what the use of money is worth, and is not affected to any material extent by the possible contingency of loss. Loans must be amply secured or they cannot be obtained at any ordinary rate of interest. Investments in industrial enterprises are, to a greater or less extent, without such security. The possibilities that they will not yield a profit, and may not even return the principal, are so great that no capitalist will embark in them unless tempted by the promise of much larger returns than the prevailing rate of interest. It may be stated as a rough rule that a capitalist is not justified in putting his money into industrial enterprises unless there appears reasonable promise that dividends will be two or three times the prevailing rate of interest. Thus, if the rate of interest be five per cent, dividends of from ten per cent to fifteen per cent cannot be considered unreasonable. There may, of course, be conditions and considerations that would make a lower rate of dividend acceptable. Thus the stocks of railroad companies and many established industrial companies, listed on the stock exchanges, can usually be sold at any time, and if the owner of them distrusts their ultimate value, he can usually dispose of them and

turn them into cash at short notice and before any very serious loss occurs. In the case of many corporations a permanent market for their products is well assured, and their prospects of commercial success are greatly increased by the fact that their franchises protect them more or less from competition. This is usually the case with the quasi public corporations which are the subjects of this discussion. But, even in these cases, there remain such contingencies that a profit of double the prevailing rate of interest cannot be considered unreasonable. As the capital of such enterprises, whether owned by municipal or private corporations, is usually borrowed, and as the interest charge must be first paid out of the earnings before dividends can be paid to stockholders, these "fixed charges" may be neglected in any comparison, or may be considered a part of the running expenses. It must be noted, however, that where a private corporation borrows the whole of its money capital, as by the sale of bonds, the only capital contributed by the stockholders is that represented by the franchise rights, the "good will" of the concern, and the responsibility which their names may lend to the business. It is usually difficult to place a money value upon these, or to determine the dividends to which they are entitled.

It must be noted also that municipalities can usually borrow money at a lower rate of interest than can private corporations, and whatever this difference may be, it should be credited to the operating account of municipal ownership.

The practice of inflating (watering) stocks beyond their true value, *i.e.* the actual sum invested, while often a very

attractive and profitable operation to the owners, cannot be justified, in the case of the quasi public corporations, upon any ground of justice or of sound economics. Their case is quite different from that of purely private corporations. They owe their existence to an agreement between the municipality and themselves, one of the implied if not stated conditions of which is mutual benefit to the contracting parties. The private corporation usually receives some concession or some guaranty from the municipality equivalent to capital, for which it (the municipality) is entitled to a consideration, and to a share in the benefits of the compact. In strict justice, neither party has a right to conceal from or misrepresent to the other, for the purpose of securing an advantage thereby, the true condition of the business. When, therefore, a private corporation, being a party to such a contract, resorts to the inflation of its capital in order to create the impression that it is earning only reasonable profits, or for any other purpose, it commits an act which is wrong in morals and wrong in equity, whatever may be its legal status. There are, however, extenuating circumstances that deserve consideration. Private corporations often enter into contracts with small but growing municipalities to supply public utilities upon terms which must result in loss instead of profit for years to come. They do this upon the reasonable expectation that the growth of the municipality will in time increase the value of the business, so that, in the end, not only will these early losses be recouped, but, upon the whole, a good profit will be secured. This is a legitimate and perfectly fair business risk, without which the younger and smaller cities would

often not be able to secure upon reasonable terms the service desired. When the private corporation has thus for years realized no profit and may have sustained actual loss in carrying out its engagements, it is clearly entitled to compensation when more prosperous times come with the growth and expansion of the city. Conditions of this kind are entitled to just consideration in judging of the reasonableness of present profit, and the private corporation should not be tempted or forced to resort to questionable methods to secure what is fairly due to it.

It ought to be possible so to frame and administer contracts between the municipality and the private owner of public utilities that inflation of capital could be prevented, the rate of profit fixed, and all net earnings in excess of that rate divided in some agreed ratio between the municipality and the owner. If this should be successfully accomplished, one of the strongest present arguments for municipal ownership would lose the greater part of its force, and the discussion would be confined to comparatively narrow limits. In the next chapter this phase of the question will be considered.

Another matter which enters into the discussion relates to the wisdom and propriety, on the part of the municipality, of investing the large sums required in the construction of plants for supplying public utilities. The importance of the question becomes greater where, as in many cases, a debt limit is fixed by the state constitution or by state legislation. On the one side it is argued that a debt contracted for the establishment of a business enterprise which will be not only self-supporting but will provide from its earnings a sinking fund for the ultimate

extinction of the debt, is really not such an obligation as is ordinary indebtedness, and should be distinctly excepted from the operation of laws that are otherwise necessary and salutary. Since such indebtedness does not depend for its extinction upon ordinary taxation, the argument is undoubtedly sound, provided that the success of the enterprise is reasonably certain. But it is said, on the other hand, that the financial success of all such enterprises is problematic, and that it is therefore unsound as a business proposition to assume that they will meet the expectations of their projectors and be entirely self-supporting to the extent of taking care of the debt incurred for their installation, and that therefore debts thus incurred can never be considered as involving no liability upon the taxpayers. It is undoubtedly true that the business man who is in debt, however good may be his prospects of meeting his indebtedness, never can feel entirely secure until it is paid off, and the fact of the obligation materially affects his credit rating. The same law must necessarily apply with more or less force to the municipal debtor. Unexpected and unforeseen conditions or casualties may occur through the operation of which a project may be a failure as a business enterprise, and the municipality may be called upon to meet the obligation incurred, by taxation or from other sources of revenue. While ordinary casualties, such as the destruction of buildings and machinery by fire, may be provided against by insurance, the insurance will seldom cover the whole loss, and there will generally be a large part of the investment that is not insurable. An illustration is the case of the city of Austin, Texas, where a relatively enormous debt

was incurred by the municipality in the building of a dam to supply power for operating its water and lighting plants. Not only was the enterprise commercially unsuccessful, but the dam, constructed at great cost, and not insurable, was destroyed by an unusual freshet in the river, resulting in the practical bankruptcy of the city. Sound business principles undoubtedly dictate that it is not wise or prudent for municipalities to incur debts of this character if public utilities can be supplied otherwise at reasonable cost. Our American cities are usually sufficiently burdened with other debts that cannot well be avoided, and wherever private capital can be induced to provide public utilities upon fair and reasonable terms it would seem wise to avoid the heavy obligations that municipal ownership must involve.

It is well to note in this connection that original estimates of the cost of a prospective enterprise may prove to be unreliable and misleading, particularly if made by municipal officers without large experience in the special business in view. This is illustrated in the experience of the city of Detroit with its municipal electric lighting plant. The original estimate of cost, upon the basis of which the enterprise was entered upon, and which was thought to be ample, was $600,000. The cost of construction and equipment at the time the plant was put in operation was stated to be (report of June 30th, 1896) $633,141, which was a very close approximation to the estimate, but it was soon found that the plant was inadequate and that additional machinery had to be provided, and the total investment on June 30, 1899, was reported as $833,803. This meant not only largely increased

indebtedness, but an increase of one-third in interest charges to be added to the cost of service.

The advocates of municipal ownership claim that reports and statistics show conclusively that where plants supplying public utilities are owned and operated by the municipality, a saving, and generally a very large saving, in cost has resulted, and that on the evidence of these reports the wisdom and economy of municipal ownership are undeniable. To this it is replied that such reports are generally incomplete, inaccurate, and therefore unreliable, and prove nothing. It is not asserted that they are purposely made to be misleading, but that their deceptiveness is due to faulty bookkeeping and failure to charge the service with all the items of cost that go to make up the real aggregate. Thus, in some of them interest on the investment is omitted and no provision made for a sinking fund; in many others no allowance is made for depreciation on buildings and machinery, nothing is charged for insurance of various kinds, nor for state taxes, and no consideration is given to the municipal taxes that would have been collected from a private owner. It must be admitted that these defects, or at least some of them, appear to exist in too many of these accounts, and that statements of cost based on them must therefore be rejected, or supplemented by fuller information.

An instance of this kind has already been given in a preceding chapter, where reference was made to a report by the municipal authorities of Detroit that the cost to the city of electric lights supplied by its own plant during the year ending June 30, 1898, was $51.85 per lamp per year, whereas it is asserted that a careful examination

of all the facts showed that the actual cost, when everything was charged up that should be (except provision for a sinking fund), was $94.17 per light. Incomplete and inaccurate accounts and statements are, of course, of no real value to either side in the discussion. What is wanted is not some truth, but the whole truth. When we have before us reports from a sufficient number of municipal plants, made up in accordance with approved standards of bookkeeping, audited and certified to by reputable expert accountants, we may begin to study this branch of the subject intelligently. As an example of the character of statement needed may be mentioned the report of Messrs. Haskins & Sells, certified public accountants of the state of New York, upon the municipal lighting plants of the city of Chicago, for the period from January 1st, 1887, to December 31, 1900, — a report which may well be used as a model by municipal accountants. While we are not warranted in basing general conclusions upon the results of a single department in a single city, some of the facts revealed by this examination are worth attention as illustrating what has been said.

It is a fortunate circumstance that a part of Chicago is lighted by a private corporation, so that we are enabled roughly to compare the results of municipal operation with those of private operation in the same city. It appears that the total cost of lighting by the municipal plants during the period of thirteen years covered by the report was $2,556,533.61, while if the same lights had been supplied under contract at the prices received by the private corporation, the total cost would have been $2,507,110.50, from which it appears that the cost under

municipal operation was $49,423.11 more than it would have been under existing contract prices of the private corporation. It appears, however, that during the last year of the period (1900) the cost per lamp under municipal management was $99.88, while the contract price with the private corporation would have been $105 each for 2,136 lamps and $137.50 for 1731 lamps, — an average of $119.55. A great reduction was made in the cost of lighting during the period by the municipal plant, largely due, no doubt, to the greater efficiency that comes from experience in management. Thus, the average cost per lamp for the first three years of the period was $195.69, while that for the last three years was $107.18, — a decrease in cost of over forty-five per cent.

We may study this report a little further for the purpose of calling attention to the caution that is always necessary in forming conclusions based on such reports.

The total cost of the service is subdivided into three general heads, each made up of a number of items. Taking the last year reported, these general heads, the amount charged to each, and the percentage each is of the whole are as follows: —

	Total	Per cent
Maintenance of plant	$26,460.58	6.9
Operation, actual	213,631.29	55.3
Operation, — estimated cost of water, insurance, taxes, depreciation, and interest on investment	146,139.98	37.8
Total	$386,231.85	100.0

It will be observed that the actual operating expense is but fifty-five per cent of the whole, while the third item, composed of charges which are too frequently omitted entirely from such reports, is nearly thirty-eight per cent of the whole. Accounts of cost which do not include these items cannot, it is very apparent, give any correct idea of the real cost of the service. It is noticeable that in this report of the expert accountants no charge is made to a sinking fund. It was presumably omitted under the assumption that the debt could be refunded perpetually when it should fall due. This may be true in the case of a municipal corporation, though it is an unsound principle to go upon. It is particularly unsound in the case of a private corporation, which is compelled to recognize the fact that it will probably go out of business sooner or later, and must therefore provide for extinguishing its indebtedness. In this case the private corporation doubtless provided for a sinking fund in fixing the prices it bid for the service, and to make the comparison fair a sinking fund charge should be made in figuring the cost of operating the municipal plants. The amount of the municipal debt incurred on account of these plants is not stated in the report, but the total amount invested in them seems to be something over $1,600,000, and at 4½ per cent for thirty years the payment to the sinking fund would have been, during the last year reported, $26,224, equivalent to $6.78 per year per lamp, making the total cost $106.66 per lamp.

We might, as is common in discussions of this question, proceed to compare the cost of municipal operation, as given in this report, with contract prices for lighting in

other cities, but such comparisons would yield no conclusive evidence unless we knew and took into consideration all the conditions affecting those contract prices. The schedule of lighting (hours during which lamps burn), the cost of coal, special requirements of contracts, and numerous other items are likely to vary so greatly in different cities that offhand comparisons of contract price per lamp would be misleading rather than instructive. We may go still further and say that it is not safe to base final conclusions as to the relative cost of the lighting in Chicago, by municipal and by the private plants, upon the figures in the report. In the first place, we do not know the actual cost to the private corporation of operating the lamps for which it receives a stated price from the city. It is possible, on the one hand, that it may be realizing very large profits or, on the other hand, that it is supplying the lights at an actual loss. The uncertainty upon this point is increased by the fact that a contract for lighting the streets usually carries with it the control of commercial lighting in the district covered by the contract. This commercial lighting, being usually free from competition, and the price not often being fixed in the municipal contract, is generally much more profitable than the street lighting, and private corporations may, in order to secure control of the commercial lighting, bid a price for the public lamps that will not more than cover, and might be even less than, actual cost, with the expectation of making up from the larger profits on its commercial lighting any possible loss. It appears, furthermore, that the two systems are not operated under similar conditions. We

are told[1] that the private corporation works its employees longer hours and pays them less wages per hour than does the municipal lighting department, and it is estimated that the item of labor consequently costs the municipality from thirty-five to forty-five per cent more than is paid by a private corporation. This is not, it will be noticed, in harmony with the claim often made that shorter hours and better pay would not increase the aggregate cost of labor, but it emphasizes the fact that where conditions are dissimilar we cannot make just comparisons. Furthermore, it is not always safe to assume that under contracts with private corporations the contract price represents the whole cost to the city. Some parts of the expense of general administration must be chargeable to the supervision of this quasi public corporation business; and it is nearly always necessary to maintain a special officer or bureau, with electricians, inspectors, and other employees, to see that contract terms are complied with, etc., and the cost of all such expenses must be added to the contract price, in order to arrive at the true cost of the service to the municipality. It will thus be seen that, even with complete and verified accounts before us, it is unsafe to jump at conclusions and assume to decide offhand that municipal ownership is profitable or unprofitable. What, then, shall we say of the army of writers and speakers who, assuming to reason from partial and unverified reports, tell us dogmatically that their particular conclusion admits of no dispute?

So far, we have dealt with the economic aspect of

[1] See "Economic and Social Factors in Chicago Municipal Lighting," by John R. Commons, in "Municipal Affairs," Vol. VI, No. 1, 1902.

municipal ownership only. But there are other phases of the question, equally important, which must be considered. These may be grouped under the general head of the relation of municipal ownership to municipal government.

One of the questions at issue is whether the supplying of public utilities is a proper function of municipal government. In the minds of those who lean toward socialism there is, of course, no room for discussion on this question, but we do not intend to consider it from that point of view. To the average American citizen the question is whether, under our Constitution and our republican form of government, municipalities may engage in enterprises which are recognized everywhere as a species of commercial business. In England these enterprises are called "municipal trading," a definition which itself indicates that they are considered as somewhat differentiated from municipal government.

The friends of municipal ownership contend that the legitimate function of government is not confined to the protection of the citizen in his rights, and to the furnishing of police power for the suppression of wrongdoing, but that it extends to everything that tends to promote the well-being, the happiness, and the prosperity of its citizens in general, — in short, that it may do all those things for the benefit of the citizen which can be more conveniently or efficiently done through the medium of government than through private effort. Theoretically, the discussion of this branch of the subject belongs to the student of political science rather than to the layman. Practically, it cannot be denied that precedent and practice have long since decided that the function

of government extends beyond the narrow limits of mere organization and police protection. In fact it has never, in a single instance, been strictly so confined in American national, state, or municipal government. The carrying of the mails and the regulation of commerce between the states by the national government; the construction and control of public works by the states; the regulation of trade, the establishing of markets, and the construction and management of public utilities by municipalities, are all examples of the assumption of governmental powers which the strict application of the narrow view of governmental functions advanced by the opponents of municipal ownership would rigidly exclude. It may be very difficult to establish the line where governmental control shall end and private effort begin, but it cannot be denied that the tendency of the times has been and continues to be in the direction of paternal, if not even socialistic control in all matters where it is clearly demonstrated that the interest of the citizen and the public at large can be better subserved by governmental power than by private effort. Whether this is or is not an unwise or dangerous tendency, we need not here discuss. The distinction is not, however, so broad and clearly defined as is often assumed. In fact the functions of governmental control and those of commercial independence so overlap each other that it is difficult to define the limits of each. It is clearly the duty of the government to protect the life of the citizen when threatened by his fellow-citizen, or any combination of his fellow-citizens. If the threat assumes the form of the sale to the unsuspecting citizen of impure or dangerous food or water, it cannot be denied that the govern-

ment is bound to interfere to the extent of protecting the life of the citizen. To what extent the government may go in furnishing such necessary protection is not a matter for discussion, so long as its acts contribute to that protection. It may go to the extent not only of assuming control of the food and water supply, but, if deemed necessary, of supplying these articles either free or for a reasonable compensation. If the water supply of a city is infected with the germs of typhoid fever, resulting in the death of hundreds of citizens, and if private enterprise cannot be induced to furnish a supply of pure water, it is but a legitimate step further in the reasoning to say that it is the duty of the government itself to furnish the necessity which private enterprise refuses to supply, and to collect a tax under the guise of water rates therefor. Again, facilities for intellectual training are in one sense a commodity that may be supplied commercially by private enterprise. But it is well known that ignorance and crime go hand in hand, and that liberal education is generally conducive to the prevention of crime. The poor are not always able to purchase the facilities for education, and the government is justified as a legitimate police measure for the prevention of crime, in supplying schools and enforcing attendance in them. The practical result is our magnificent system of free schools, supported by the government. And while it is true that the prevention of crime is probably one of the least important results achieved by them, who shall say, in view of the practical good they have accomplished, that government has overstepped its legitimate province in assuming control of and supporting them?

This reasoning will generally apply to one public utility as well as to another. Broadly speaking, the advocates of municipal ownership assert that government may legitimately engage in any enterprise intended for the public good, where it is clearly shown that, upon the whole, the public will be benefited thereby. The principle seems to be accepted by the great majority of the American people, and, as their will is law, it is practically useless to attempt to controvert or oppose it. The question is therefore practically reduced to one of utility, economy, and expediency. If it can be demonstrated that, all things considered, municipal ownership will result in benefit to the public, the system will be adopted, fine-spun theories of government, however plausible, to the contrary notwithstanding.

It is argued in favor of municipal ownership that it will tend to decrease dishonesty and jobbery in municipal government. It is asserted that the granting of franchises and the awarding of contracts for public utilities offer unusual opportunities and temptations for corrupting the members of city government; that these franchises and contracts involve vast sums of money and the opportunity for enormous profits, and that unscrupulous corporations are willing and able to pay large sums to secure the passage of ordinances giving them a monopoly extending often over a long period of years, and which, after being granted, become vested rights that cannot be abrogated. It is popularly believed that this kind of jobbery and corruption is very common, and it must be admitted that the belief appears to be supported by strong circumstantial if not positive evidence. It is

often difficult to account on any other assumption for the action of city councils in granting franchises clearly opposed to the public interest. It is asserted by the advocates of municipal ownership that if franchises and contracts for public work and public utilities were not offered to private persons or corporations, the occasion and opportunity for such jobbery would not be presented, and that this species of corrupt dealing would not only be avoided, but that unjust and burdensome contracts would not be saddled upon the innocent public. To this it is replied that the remedy for this kind of crime must be applied at the fountain head, by excluding from public office men who through weakness or avarice may be tempted to barter the public interest for private gain. Bribery requires the active coöperation of two parties, and if one of them is incorruptible it cannot be consummated. The banker who would invite or permit safe-breakers to sleep in his bank, and then devote his energy to making his vaults burglar-proof, would be laughed at if his guests outwitted him and got his money. The voter who helps to place the keys of the municipal treasury in the hands of dishonest or corruptible men, trusting to any device to prevent stealing, does not deserve more sympathy than would such a banker. If a city official will accept a bribe for granting a franchise for a public utility, there is no reason to expect that he will hesitate to rob the city in the construction and operation of a plant to supply the same utility, and if he is shrewd and patient he may get more out of it in that way than the applicant for the franchise would have been willing to pay. It is doubtless true that he can be more readily

detected, convicted, and punished in the one case than in the other, but experience proves that he will hardly be deterred by that consideration. Our banking institutions employ the most perfect devices and checks to detect embezzlement, and they spare no pains in hunting down and punishing offenders; but, judging from the number and magnitude of bank robberies by officers and employees, such means are not very effective in deterring men from such crimes. The banker will tell you that he relies for safety more upon the honesty of his employees than upon his ability to prevent them from stealing, if they are so inclined. But safeguards are proper and necessary, and to the extent that they may be depended upon it is asserted that they can be applied to the granting of franchises and the letting of contracts as well as to the municipal operation of works to supply the same utilities.

We come now to the consideration of the effect of ownership and operation of public utility plants by the municipality upon the municipal government itself. It is hoped and believed, on the one hand, that the responsibilities incident to the organization and management of great business enterprises will tend, not only to quicken the conscience and incite the patriotism of the citizen, but that the larger responsibility thus thrown upon him, and his direct interest in results, will increase his sense of public duty, and make him more careful of his vote in selecting public officers, and will thus tend to raise civic government to a higher plane.

On the other hand, it is asserted that experience does not seem to support these hopeful anticipations, since there is no apparent evidence that greater interest is

taken in municipal elections in those cities where municipal ownership exists; and the fact is pointed out that elections held for the special purpose of determining questions relating to public works attract little interest and draw out notably small votes.

It is asserted that the powerful and unscrupulous corporations that own and operate the public utilities of our cities do not hesitate to debauch municipal elections in order to gain their selfish ends; that they not only control the votes of their many employees, but that they buy the votes of others who are purchasable; that they secure the active coöperation of the political bosses by outright bribery or by "swapping" influence; that they can afford to and do spend large sums of money for the purpose, and that they are in this way enabled to control the municipality instead of being controlled by it. There seem to be substantial grounds for these accusations in many cases, though they are not often proved. It is claimed that municipal ownership, by abolishing these corporations, would remove the source of such temptation and corruption, and that it would thus be a potent influence in preserving the purity of municipal elections. On the other hand, it is asserted that the very large increase in the number of municipal employees that must result from municipal ownership would be a powerful stimulus to the "spoils" system, and would place a dangerous power in the hands of the political bosses and manipulators of elections, by which they would be able to perpetuate their power and influence; and that these political bosses do not themselves hesitate to use money or its equivalent to carry elections in their favor.

It is a well-known fact that as a rule city employees feel that it is necessary for them to vote with that party or for those persons to whom they are indebted for appointment to positions or for continuance therein. Experience teaches them that any other course is likely to result to their serious disadvantage. The increasing very largely of this class of subservient voters cannot therefore be otherwise than dangerous to the interests of good government. It is claimed, however, that this tendency can be effectually restrained in a number of ways. First among these may be mentioned an efficient system of civil service, which will remove employees from political influence. Granting that this remedy would prove effective, it is not at all certain that civil service regulations that are sufficiently drastic to exclude political influence will prove wholly beneficial to municipal operation of utilities. There can be no doubt that one of the most important conditions for the successful management of business enterprises is the undivided authority and absolute control of all subordinates by the management. If an employee, whether a clerk or a laborer, is not efficient or reliable, he must be dealt with properly and summarily. If the employee feels that his superior has full power so to deal with him, he will stand in wholesome awe of that power and its consequence. If, on the other hand, he feels that, at best, his superior has no direct power of discipline or removal, but must act in accordance with certain rules and through certain agencies, must prefer charges and prove them, he will feel sure of delay and hopeful of palliation. One may be so morally certain of the dere-

liction of an employee as to be justified in dismissing him, but quite unable to prove the dereliction and convict him in a legal manner. Private corporations secure the best results by holding each employee accountable for his fidelity and efficiency to a superior who has absolute power of action. Such administration is not inconsistent with justice, and may follow the essential principles of civil service, but to hamper and bind an executive by inflexible rules, and divided authority, cannot be otherwise than destructive of sound business discipline. Whatever merit the civil service system may have, as applied to officials and to clerical employees, there is room for serious doubt whether its rigid application to business enterprises would produce the most satisfactory results.

Another method by which it is claimed that political manipulation of employees may be avoided, and the purity of elections safeguarded, is that of placing the management of business enterprises owned by the municipality under the more or less permanent control of a single person, or a commission composed of men of high character, appointed independently of political considerations, who would have an eye single to attaining the best possible results, and would resolutely oppose the introduction of political methods into the public business. Such a condition of affairs is sometimes attained, but not as a rule. The best citizens are interested in politics, as they should be, and there is no distinct line which separates what the good citizen may do for the advancement of a party whose success he believes to be essential to the best interests of the community, from what he should not do. He cannot

be neutral, and he cannot hide his political light under a bushel. Many of his employees will be influenced in casting their votes by his example, even if he refrains from precept. He may be honest in his convictions, and may intend that his influence shall be entirely in the direction of the best interests of the community; but, like other men, he may be mistaken in his judgment. That an official occupying such a position has political influence is sufficiently proved by the fact that every politician is always anxious to have these positions filled by men from his own party. The attempt to counteract such influence by the appointment of boards in which each political party is equally represented has not generally proved a success. It must be admitted that the so-called bipartisan boards have usually failed to meet the expectations of the friends of good municipal government. Judging from experience, it seems impracticable, if not impossible, to keep politics, for any considerable period, out of municipal business enterprises. At the same time it must be recognized that it is only when municipal employees fall under the control of unworthy and unscrupulous politicians and bosses that any serious harm results. In the present unsatisfactory condition of so many of our municipal governments, when the rule of bosses and rings is so common, and "boodle" and corruption are so frequently to be expected, it is certainly desirable to curb as much as possible the power of these bosses and rings to do harm, and to prevent the perpetuation of their control. Under such conditions the army of city employees that would be necessary if a city owned and operated all its public utilities would constitute a body of voters that, under the con-

trol of unscrupulous leaders, might well be regarded as dangerous.

We have, it will be noted, discussed the subject of municipal ownership in a general way. It may often occur that special conditions will dictate the advisability and wisdom of a city's undertaking the construction and operation of some particular public work, and the reasons for doing so may be of such weight as to sweep aside all general arguments. It may be true, also, that works to supply some one class of public utilities are, for various reasons, more appropriate for municipal management than others, and may call more urgently for the direct and exclusive control of the municipality. Thus, a supply of pure and wholesome water is of such great importance to the health and life of the people, and to maintain it requires often such prompt application of remedial measures, that there may be ample justification for the municipality owning and controlling that supply, regardless of economic or other considerations.

In conclusion, it will be found, after full consideration of all the arguments pro and con and of all the facts available at present, that we are not yet ready to decide the main question finally. We certainly need further accurate data as to the actual relative cost of public service under the management of private corporations, and under municipal officials, and further observations as to the effect of municipal ownership upon civic politics. We need, further, to know whether it is not possible and practicable to license and regulate the supply of public utilities through private corporations in such a manner as to obviate the evils now, with good reason,

complained of, and at the same time secure in a large measure the benefits expected through municipal ownership, without assuming the responsibilities and incurring the dangers such ownership involves.

It would seem, therefore, the wisest course to proceed in the direction of municipal ownership very cautiously and conservatively for the present. The serious and costly blunders that are so likely to accompany imperfect knowledge and a stage of experimentation may thus be avoided.

CHAPTER XV

QUASI-PUBLIC CORPORATIONS AND THEIR CONTROL

In the preceding chapter we considered some of the facts and arguments for and against municipal ownership of public utility enterprises. While no definite conclusion was arrived at, there seemed to be sufficient reason for advising that no hasty action be taken, but rather that great caution should be exercised and safe conservatism adhered to until we shall have more experience and light upon the whole subject.

A reëxamination of the question of securing these public utilities through contracts with private corporations was suggested, with the view of determining whether this may not be accomplished in such a way as to avoid most of the objectionable features and all the abuses now so common, and thus relieve the municipality of the financial burdens, responsibilities, and dangers of municipal ownership.

The question of controlling these semi-public corporations has been widely discussed, though not always in a scientific spirit or from a purely economic standpoint. We may not expect to say much that is new upon the subject, but it may be well to review the present situation, and call attention to what may, as the writer conceives, offer a practical solution of the problems involved.

The term quasi-public corporations is now commonly

used to designate those privately organized corporations that undertake to supply the public needs of the people of a city, under franchises or contracts granted by the municipal corporation and subject more or less to its control and regulation. The term is not a very happy one, but so long as we understand what it means, it answers the purpose sufficiently well.

These quasi-public corporations are, like most private enterprises, organized for purely business purposes, and their object is profit. Their aim is to secure the largest possible returns from the capital, skill, and labor invested. This aim is certainly justifiable, and is even laudable in so far as it works no injustice to others. No one would for a moment contend that they are not entitled to a reasonable return upon their capital and labor, and the only contention is as to what constitutes a reasonable return. One of the elements that must be considered in dealing with the question is that of risk or contingency. A capitalist may be quite willing to invest his money in United States bonds which yield but $3\frac{1}{2}$ per cent profit, while he will not invest in a business enterprise involving risk, that does not promise a much higher rate of profit, because in the one case he has entire confidence that the interest will be paid and the principal returned, while in the other he recognizes that he may not only receive no profit, but may lose a part or the whole of the principal.

But quasi-public corporations differ from ordinary private corporations in one very important respect. The purely private corporation relies wholly upon its own resources, and is independent in its business operations,

and the amount of profit it may fairly make (so long as it keeps within the bounds of law and equity) is limited only by the prices it can command for its products in the market; and if it controls the market through monopoly, it may realize prices and make profits that would otherwise be impossible. The quasi-public corporation, on the contrary, operates under a contract, called a franchise, with a municipal corporation, which confers upon the private corporation certain rights and privileges. Whether this franchise is conferred by state statutes or by municipal authority does not matter. Theoretically, at least, the franchise is an agreement between the two contracting parties for their mutual benefit. Each may be said to contribute to the joint capital of the enterprise. The private corporation contributes the money, while the municipal corporation contributes and guarantees rights and privileges which enhance its prospects of success, and without which it could not operate at all. These rights and privileges are therefore as truly valuable assets of the private corporation as is its money capital.

To all intents and purposes the municipal corporation is a special partner of the private corporation, and is entitled to an equitable division of the profits accruing. This view has a rational foundation in reason and equity, whether or not it be sound in law.

The contribution of the municipal corporation — the franchise — which usually excludes competition, is not infrequently the most valuable asset of the private corporation. It makes the investment of money in the enterprise less hazardous, and therefore more attractive to capital, and often enables the investor to realize

large profits. But as these franchises have been usually framed, they do not provide for an equitable division of the profits between the two parties in interest, and the municipal corporation receives no proper consideration for its contribution to the joint capital. Dissatisfaction on the part of the citizens of the municipality naturally results. These citizens feel and insist that as the municipality is practically a partner in the enterprise, it is, therefore, entitled to a fair division of the profits. The demand may be for better and cheaper service, rather than for a money consideration, but it amounts to the same thing. The private corporation does not admit the partnership relation, holding rather that the relation is contractual alone, and, having performed its part of the contract, it is under no obligation to do more. And it usually exacts the pound of flesh. Under too many franchises its position is, too, impregnable, and the obvious injustice must be borne by the helpless municipality and its citizens. Palpable injustice, however strongly it may be entrenched behind the law, is never submitted to patiently, and there springs up between the two interests a condition of antagonism which grows with what it feeds upon, until the breach becomes too wide to admit of reasonable adjustment from either side.

If we examine into such cases, we shall generally find that the trouble is not inherent in the system, but is traceable to the imperfect and unfair provisions of the original franchises. These were generally devised and entered into at a time when the city was much smaller and when the importance of the rights given to the private corporation were not and perhaps could not be foreseen or appre-

ciated. The importance of obtaining service urgently needed may have seemed of greater weight than the terms upon which it was secured. The documents were hastily drawn, often by incompetent lawyers, and passed without proper consideration on the part of the city; not infrequently the projectors, usually shrewd business men looking after their own interests alone, and having an eye to the future rather than to the present, themselves framed the papers, aided by the best legal talent, and embodied in them innocent-looking clauses that contained the germs from which serious trouble for the municipality would later develop. The result has been that the interests of the municipality have not been covered or safeguarded and, too late, it finds itself completely in the power of a rapacious corporation with vested rights, and often with perpetual life.

Whatever may be the legal interpretation of quasi-public franchises, the only true theory of them is that they are, or should be, a compact for the mutual benefit of the two parties entering into them; and, in accordance with this theory, the only rational and satisfactory policy for each party to pursue is one of mutual justice and fair dealing, in the promotion of which one party is under the same obligation as the other.

The essential foundation of such a policy of justice and fair dealing must be a reasonable and equitable compact between the parties, and consequently the framing of the original franchise is a matter of the greatest importance. The ordinary city council should not be wholly intrusted with this important duty. As a rule, its members are not fitted either by natural ability, acquirements, or previous

experience for a duty requiring, in the highest degree, economic knowledge, legal acumen, and business sagacity.

The general provisions of these quasi-public franchises are a fit subject for the deliberative wisdom of the state legislature, particularly since uniformity in the terms of such franchises throughout the state is desirable for many reasons, some of which will be referred to hereafter. The adoption of a wise general law covering the granting of franchises, and the making of contracts for supplying public utilities, would undoubtedly be the most effective preventive of the careless, unwise, and unjust municipal franchises that are now so common in our American cities.

The subject of such general state legislation will be taken up more in detail later on in this chapter, after some of the underlying principles that should be kept in mind in any legislation dealing with the subject have been briefly discussed.

First: The fundamental principle that should govern in granting franchises to and regulating the operations of quasi-public corporations, whether under state enactment or under municipal legislation, should be that of mutual duties and mutual compensations. To be more specific, the private corporation should receive a fair, and even liberal, reward for its expenditure of capital and skill; the municipality should receive efficient and adequate service upon reasonable terms; and when these conditions are satisfied, any surplus revenues should be equitably divided between the two.

The business relations that must exist between a municipality and a corporation furnishing public service are neces-

sarily of such an intimate character, and extend over so long a period, that it is in every way desirable and important that the two should work together with a reasonable degree of harmony. The spirit of antagonism that so often exists (both in the inception and operation of quasi-public corporations) cannot be otherwise than incompatible with the public interests. As well might two partners expect to prosper in business when each enters the firm with the deliberate purpose of taking advantage of the other, and follows up such a beginning with constant enmity and controversy. To speak of the possibility of a relation comparable to partnership between a municipality and a corporation supplying public service is likely to provoke a smile of derision among those familiar with the present condition of things, and it is, of course, too broad a term to express correctly the true relation that one should bear to the other; but it conveys more nearly a correct conception of the ideal relation than does the idea of two rival business firms, each striving to obtain undue advantage over the other. If the problem of the satisfactory working together of municipalities and quasi-public corporations is ever worked out, the solution will be found along lines of mutual justice and benefit.

Second: The fact should be recognized that capital invested in plant to supply public utilities in cities is, to a large degree, protected from those uncertainties and hazards that attend ventures in ordinary industrial enterprises. Such investments should not, therefore, be regarded as speculative in character, since a reasonable and regular return can nearly always be depended upon; and, indeed, a minimum rate of dividend or interest might be

safely guaranteed by the municipality under such prudent and reasonable conditions as will hereafter be outlined. Rates for service might be permitted and authorized that will assure such a minimum interest or dividend, so that the capital would be almost as safely invested as in government or municipal bonds. It would then be proper and justifiable to fix maximum rates which would limit to a definite percentage the dividends that might be paid upon the capital actually invested. Under such conditions the certainty of fair returns and the possibility of liberal maximum dividends would be sufficient to make the investment attractive to conservative capitalists.

Provisions of this character would, of course, involve such regulation of the private corporation as would prevent the inflation of its capital by methods commonly known as "stock watering." They would involve also some method of ascertaining the actual earnings of the private corporation. Both these, it is admitted, have been the most difficult matters to deal with in the whole range of the controversy with quasi-public corporations, but it does not follow that their adjustment is impossible. We shall consider later on some of the methods that seem to promise such a solution.

Third: The term of years over which a franchise should extend has been widely discussed, and there exists much difference of opinion on the subject. The preponderance of opinion seems to be in favor of a definite period of years, but no general agreement exists as to the proper length of the period. Looking at the matter from the standpoint of the municipality alone, it seems desirable to make the period as short as possible. Our American

cities are growing so rapidly, and the conditions change so quickly, that it seems inadvisable to bind up public business in inflexible contracts for any considerable length of time. On the other hand, the projectors say with good reason that it is impossible to obtain capital for the construction and operation of such public works at reasonable rates of interest, if at all, for short franchise periods; that such works are as a rule designed with a view to future rather than to present profits; that often many years are required for the development of an enterprise into a profitable condition; that the plant employed has an average term of natural life and usefulness, and that if it must be disposed of before it has reached the end of that term there may result a material loss. This last point seems to be not well taken, since the plant must in any event be maintained in efficient condition until the end of the period, and in every large plant some parts will have been worn out and be in need of renewal long before others.

On the other hand, it is argued that franchises should be revocable for sufficient reason at any time, provided the owner be fairly compensated.

This view is attractive in theory, but practical difficulties arise when we attempt to arrive at a fair compensation. It is very difficult to place a price upon a plant that has been in use for a period of years but is yet in good condition, since its real value to the owner and to the prospective purchaser may be very different. It may be capable of performing good service for so long a time in the future as to be almost as good as new to the owner, while to the purchaser it may be worth only what it will bring in the market as second-hand machinery.

It stands to the owner as so much money invested, and possibly capable of earning enough during its further life to repay the original cost and afford a good profit. It would not be fair to him to take it at its market value and cut off this source of possible profit. Nor is it fair and right to revoke a franchise at a time when, after years of unproductive operation, conditions have improved so as to promise a good profit in the future, unless the owner is compensated accordingly.

Where, however, a franchise has been granted upon terms that contemplate, and will, to some extent, accommodate themselves to changing conditions, there should arise no urgent necessity for terminating it abruptly or within a very short period.

Still another not inconsiderable class believe that such franchises should be either perpetual or for so long a term as to be equivalent to perpetuity, with provisions for readjusting the terms as frequently as may be found necessary. While the investor would usually very much prefer a perpetual franchise with fixed terms, or with provision for modifying those terms upon some equitable basis, he must necessarily oppose one which allows the terms to be changed at the will of the municipality, without his consent, since this would introduce an element of uncertainty and instability in the whole enterprise that would repel capital.

Upon the whole, it would seem that a franchise for a definite period of years with a fair provision for taking over the plant by the municipality at the end of the period is most advantageous to both parties, and that a period of from twenty to thirty years is perhaps, all

things considered, most appropriate. Whatever be the period (unless perpetual), it is very important that the manner in which the franchise shall be terminated, and the disposition that shall then be made of the property of the private corporation, shall be so definitely and clearly provided for that no misunderstanding can arise when the end of the period arrives. It is quite common, and may be entirely proper, to stipulate that the franchise shall expire absolutely without notice or other action on the part of either party upon the date named, and that the plant of the private corporation shall thereupon become the property of the municipality without any compensation whatever. There are, however, some practical objections to this course; for instance, the private corporation, knowing that its plant will revert to the municipality, may allow it so greatly to deteriorate during the last few years of the period that the service may be crippled or inefficient. It would seem better to provide that the plant and property should be taken over by the municipality at a fair price, to be ascertained at the time. Where this is to be done, the method of determining the amount of compensation should be clearly and definitely stipulated. When such a transfer of property is made at the expiration of the franchise, there can, of course, be no claim for compensation for franchise rights or "good will," though this may be an element of great importance where the plant is taken over before the expiration of the franchise. It should be distinctly stated whether the property is to be appraised at its original cost; or at the cost of duplicating it at the time; or as a "going concern," in which case its

value for further service *in situ* must be considered; or whether it shall be valued at what it may be worth in the market at the time; and the manner in which its value, in any case, shall be arrived at. Generally, the most satisfactory plan is to appoint appraisers or arbitrators in the usual way to determine its value. In those cases where the municipality reserves the right to revoke the franchise at any time and take over the property, the principles upon which the value of the franchise and the good will of the business shall be determined should be distinctly stipulated.

Fourth: The question of fair and reasonable rates to be charged for public service is not only a most important one, but it is the most fruitful source of controversy between quasi-public corporations and municipalities. The question of efficiency and quality of service given is so closely connected with, if not involved in, that of rates, that they can be best considered together. As a general proposition it may be stated that a fair rate for any service is cost and a reasonable profit. No quasi-public corporation should extort more and no municipality should demand less. Under the present conditions the actual cost may be known to the private corporation, but it is seldom made public and is, therefore, unknown to the municipality and its citizens, by whom it is doubtless generally underestimated, and people having their own interests in view are disposed to believe that rates are unnecessarily and unreasonably high. It is very difficult to determine in advance with close approximation what a given service will cost, and it is still more difficult to know whether rates that are proper now will

continue to be so in the future. Not only may the elements of cost change, but the character of the service demanded and rendered may vary within quite wide limits. In the early years of the franchise the business is likely to be less remunerative than later, and rates which then seem reasonable may become exorbitant when the volume of business has greatly expanded and improved methods and machinery have been introduced, and consequently there is very frequently good ground for complaint and dissatisfaction with existing rates in large cities. It is, therefore, desirable and important that rates should not remain unalterably fixed throughout the whole life of the franchise, but should be subject to readjustment from time to time in order that they may be accommodated to changed conditions. There should be the same flexibility with reference to the quality of the service rendered. Both may adjust themselves where the corporation supplying the service is left entirely free from municipal regulation, since the lowering of a rate or the improving of a service may increase net earnings, and therefore be profitable; but in a matter of so much importance the municipality should have something to say, and there should be some accepted method of adjusting rates, earnings, and profits when conditions make changes desirable. If rates were fixed upon the basis of cost and a percentage of profit varying between a minimum and a maximum, it would then be practicable to vary these rates from time to time without doing injustice to any one. There is, in fact, no other basis upon which they can rationally be determined. To provide that they shall not exceed the rates charged in

other cities is simply to adopt standards that are themselves purely empirical, and, besides, that which is a fair rate in one city may not be in another, because of differing conditions; to say that they shall not exceed certain figures is merely to fix a limit in one direction, which may be wide of reasonableness; and to name them at random, or at the dictation of the interested corporation, is to set correct business principles at defiance. The only objection that can be raised to the method of basing rates on cost and a fair profit is the difficulty or assumed impossibility of ascertaining the true cost, but this is a difficulty that it should be not only possible but quite practicable to overcome.

It is assumed by many that service should be supplied to the citizens at exact cost to the municipality; in other words, that the municipality is not entitled to any revenue therefrom, to help bear the general burdens of the government. There seems no just ground for such an assumption so long as the principle of equal taxation is not infringed. It may therefore be not only entirely just, but good policy so to arrange rates for public service that there shall be a margin of profit to the municipality, in addition to a fair profit to the corporation supplying it. In fact, there is just now a strong demand that the municipality shall exact from the quasi-public corporations a compensation for their franchises, which is but another form of saying that the municipality should share the profits of the private corporation, and it is assumed that the rates charged would be sufficient to permit of such a division of profits.

As to quality and efficiency of service, it should be pos-

sible for the citizens of a municipality to determine the matter for themselves. Whether they prefer an inferior and cheap service or a superior and more expensive one, is a question in which they are more deeply interested than either the municipal government or the private corporation. They should have whatever they are willing to pay for. It is needless to say that this is not the case at present, although the people sometimes succeed by indirect methods in forcing much needed improvements.

The reader will probably feel that the whole drift of this chapter is toward impossible ideals, rather than toward a practical solution of the problems we are considering. If so, let him remember that the ideal must precede the practical. It is only after we have arrived at what we consider the best ideal solution of an economic or industrial problem that we are prepared to attempt that solution along practical everyday lines. Having in mind what would be best, we try to achieve the nearest practical approximation to it.

The underlying idea, it will be noticed, in what has been said, is that of coöperation, rather than of antagonism between the municipality and the quasi-public corporation. The phrase, "community of interest," so familiar to the public just now, expresses very well the ideal relation. The problem is to enlist private capital to supply our public service utilities upon an investment instead of upon a speculative basis, in such a way that the capital shall be assured a fair return, and the municipality shall be assured of good service at reasonable prices. It may be roughly compared to ordinary municipal financing. The municipality needs money, and is willing to pay for

its use. The capitalist stands ready to supply the money upon terms mutually agreed upon, feeling confident that every engagement of the municipality will be met and that, therefore, his investment is secure; and the transaction becomes mutually satisfactory. Even in the absence of good faith on the part of either, each party is amply protected by carefully drawn laws which define and guard their respective rights. Now, it should not be merely and hopelessly ideal to conceive that some such relation is practically attainable between municipalities and quasi-public corporations. It may and doubtless will take time to formulate and crystallize into practice the principles, laws, and practical details through which such a result may be accomplished, but if true progress lies in that direction, we cannot turn our faces that way too soon.

By what means and through what agencies may such a state of affairs be brought about? Upon this question there is room for wide differences of opinion, and there is need of careful study and intelligent experiment. There is to-day no more promising field for the best efforts of the statesman and lawmaker, the economist, the student of municipal government, and the industrial expert, than the one we are considering. Whether we look at it from the point of view of the capital invested, or of its bearing upon the material prosperity, the health and the happiness of the twenty-five millions of people living in our cities and towns, we must concede that there are few more important problems before us.

Without assuming any expert knowledge of the subject, or claiming that the views expressed are new, I venture to

outline a plan which ought to be workable, and should offer a solution of what is now a difficult problem.

All quasi-public corporations should be organized and operated under a general state law.

The provisions of such a law should be so radical and far-reaching as to assume, within the limitations found necessary, the absolute control of quasi-public corporations, and of the relations between them and the municipal corporations. Only so much should be left to the discretion and judgment of municipal governments as may be absolutely necessary. It will be at once objected that such legislation would be subversive of the principle of local self-government, a principle that should be fostered and protected, rather than suppressed. To this it may be replied that the legislation contemplated would be general in character, applying to and being for the benefit of all municipalities; that it would deal with a matter which the local municipal governments are admittedly seldom competent to handle, — a matter requiring a degree of ability, wisdom, and careful investigation, and an amount of expert knowledge, that members of city councils seldom possess and have not the time and opportunity to acquire; that it would prevent the hasty and ill-advised granting of franchises that are to continue in force for a generation, or longer, with all the burdens they impose on the public, and that it would effectually block unscrupulous corporations from securing, through the corruption and bribery of city councils, rights and powers they could not hope to secure in any other way. If it would successfully accomplish these things, no narrow theories of local independence and home rule can be

successfully urged against it. "The greatest good to the greatest number" is a maxim that must be followed, even if it involves some curtailment of individual liberty.

In the framing of such a general law, sufficient time and deliberation could be devoted to it to work out its every feature and detail in the most perfect manner. The best statesmanship and legal acumen, the ablest expert knowledge, and the best civic talent, aided by wide experience, would doubtless be enlisted in framing its provisions, and the result should be a wise and comprehensive code, under which justice and equity to both the private and the municipal corporation would be assured. Its enactment and application would relieve the municipal authorities of one of the most difficult and responsible duties they are now called upon to perform, and the municipality of one of the most dangerous possibilities of municipal misgovernment. No longer would it be possible for a council elected for a short term, and without the necessary qualifications for such important duties, to enact, hastily and without proper consideration, franchises that must bind the municipality for a long period of years. Such a law would assure uniformity in the organization and management of quasi-public corporations, which is most desirable. Its provisions would soon become generally understood, and both the citizen and the stockholder would know exactly where each should stand and what were the legal rights and duties of each to the other. It would become, within the state, and in the field of quasi-public corporations, what the National Bank Act is in the domain of banking, or what the Interstate Commerce Act is in the field of railroad transportation.

Such a law should prescribe a means for fixing and controlling the capital of these corporations so as to prevent overcapitalization in the beginning, and inflation or "stock watering" thereafter; should provide for the establishment and modification when necessary, of rates for service; for the disposition of the net earnings of the corporation; for the auditing and publication of accounts, and for the adjustment of controversies that might arise between the municipality and the corporation.

One of the most important of its provisions would be the creation of a commission or board which would have charge of the administration of the law. This board should be composed of men of special ability and of the highest character, appointed for long terms of office, and in some way that would make them as independent as possible of politics and political influence. The functions of this board would be both administrative and judicial. It would resemble in its powers and duties the Interstate Commerce Commission of the United States.

When a corporation should apply for organization under the law, the board would examine its plans and estimates of cost, and would approve or modify the amount of its proposed capital stock, which thereafter could not be increased without its authorization. It would consider, and approve or modify, after hearing, the rates proposed for the service to be supplied, and would have the power to modify these rates when convinced that the condition of the business demanded or warranted such change. It would have authority to require the corporation to increase its plant and extend its service when the needs of the municipality demanded such enlargement or exten-

sion, provided the demands were justifiable and reasonable. To enable the board to act intelligently in all these matters, each corporation would submit to it annually a full report of its operations, receipts, and expenditures. The board would be empowered and directed to examine and audit the accounts of the corporation, to certify to the correctness of the reports, and to make these reports public. Such publicity of accounts would not be objectionable to the owners of the corporation, since, under the system contemplated, the dividends to the stockholders would be guaranteed not to fall below a minimum, and would be restricted to a maximum, and all surplus earnings would be divided between the corporation and the municipality in a stated ratio. Publicity of accounts would, alone, be a very valuable advance upon present practice, and would prevent much of the dissatisfaction and controversy that now prevail, since it would disclose the actual condition of the business and enable the public to judge correctly of the reasonableness of charges made for service.

In short, the board would have general control of all corporations organized under the law, and would act as arbiter in all differences that might arise between the municipalities and the corporations. Such a tribunal should, and doubtless would, command the confidence of the public and of all parties interested, and its influence and rulings could not be otherwise than beneficial to the just interests of all.

Under the operations of such a law, administered by such a board, capital would feel secure, and both the stockholders and the public could safely rely upon being treated fairly and justly.

The scheme here outlined has been, and will continue to be, pronounced impracticable and chimerical by the class of corporations whose interests it would affect, and by the local politicians, whose power and influence it would tend to abridge, as well as by some earnest and able students of municipal problems. Nothing short of a fair trial for a sufficient period of time will prove whether its advocates or its opponents are right or wrong. The former may truthfully assert that it could not well prove more unsatisfactory than the existing state of affairs, and that there is good reason to believe that it would greatly improve present conditions, even if it did not accomplish all that is claimed for it. They can point with confidence to the results of such partial attempts as have been made in this and other countries toward a solution of these troublesome problems along similar lines. There are certainly enough facts and arguments in its favor to warrant a fair trial of it in actual use.

But this, or any other new legislative action, could not be *ex post facto* in its operation, and would therefore apply to new quasi-public corporations only. The pressing problem in most of our cities is how to deal with corporations that now exist, intrenched behind irrevocable franchises having many years yet to run. What can be done with these? No explicit general answer can be given. Each one must be dealt with according to the circumstances of its special case. Even where such a radical measure would be justified, it is usually impossible to revoke the franchises of the corporations and sweep them out of existence, and in too many cases these franchises reserve to the municipality little or no power to enforce regulative measures.

The most hopeful feature of the situation is found in the fact that these corporations are manifesting an increasing respect for public opinion, and that not a few of them are awaking more and more to the fact that their true interests will best be served by a policy of conciliation and coöperation, rather than one of antagonism to the municipality and the public. They are finding too that a liberal policy in supplying what the public demands in the way of reasonable rates and improved service generally results in expanding their business and increasing their profits. They may often be persuaded to make concessions that they could not be legally forced to make. It would seem the wisest policy on the part of the municipality to meet this disposition on their part in a reasonable spirit of concession and compromise, and thus to make the best of a situation that cannot be wholly cured and must therefore be more or less endured. Half a loaf is undoubtedly better than nothing, and should be accepted if to secure the whole loaf is impossible. It will probably be found that in most cases more can be accomplished by conciliatory action and a disposition to meet the corporation frankly on a reasonable basis of settlement than by hostile or retaliatory measures. Unfortunately, the public, not always fully informed, and generally disposed to hasty action, will clamor for a fight, and the public officer who shows a disposition toward a more moderate, though more promising course, is likely to be misjudged and abused, even by good business men who in conducting their personal affairs always endeavor to compromise cases where the law is not very clearly on their side. Public clamor is, however, not always a safe guide, and should

be disregarded when it is clear that the interests of the public may be better served by doing so. Should the corporation reject overtures for a fair and reasonable adjustment of differences the municipality will be fully justified in declaring war and prosecuting it to the bitter end, and the corporation will deserve, and should be given, no quarter.

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